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DEPARTMENT OF THE INTERIOR
FRANKLIN K. LANE, Secretary

UNITED STATES GEOLOGICAL SURVEY
GEORGE OTIS SMITH, Director

BULLETIN 644

TRIANGULATION AND PRIMARY TRAVERSE

1913–1915

R. B. MARSHALL, CHIEF GEOGRAPHER

POLITECHNIKA GDAŃSKA
ZAKŁAD GEOLOGII

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POLITECHNIKA GDAŃSKA
ZAKŁAD GEOLOGII



MAP OF THE UNITED STATES SHOWING CONDITION OF ASTRONOMIC LOCATION AND PRIMARY CONTROL

to January 1, 1916

A. HOEN & CO. BALTIMORE, MD.

TRIANGULATION AND PRIMARY TRAVERSE, 1913–1915.

R. B. MARSHALL, Chief Geographer.

POLITECHNIKA GDAŃSKA ZAKŁAD GEOLOGII

INTRODUCTION.

PERSONNEL.

Field work.—The field work of primary control, the computed results of which are given in the following pages, was carried on from 1913 to 1915, inclusive, under R. B. Marshall, chief geographer, with Frank Sutton, W. H. Herron, Sledge Tatum, George R. Davis, and T. G. Gerdine, geographers, in charge, respectively, of the Atlantic, Central, Rocky Mountain, Pacific, and Northwestern divisions.

Credit is given to the various topographers, assistant topographers, and aids directly in charge under the headings of the several lists.

Computation.—The office computations were under the supervision of E. M. Douglas, geographer. The results were computed by the following members of the topographic branch, detailed from time to time to this work: D. H. Baldwin, T. M. Bannon, L. F. Biggs, D. S. Birkett, R. H. Chapman, C. E. Cooke, J. R. Ellis, J. I. Gayetty, G. T. Hawkins, Oscar Jones, C. B. Kendall, J. F. McBeth, Fred McLaughlin, F. J. McMaugh, E. L. McNair, C. L. Nelson, A. C. Roberts, H. S. Senseney, C. F. Urquhart, and J. H. Wilson. Mr. Biggs and Mr. Urquhart did all their computing in the Sacramento office. The data were compiled for publication by S. S. Gannett, geographer.

DATUM.

Wherever practicable, and unless otherwise stated, positions have been computed on North American datum.

STATION MARKS.

Permanent marks are placed at all occupied triangulation stations and at certain of the primary traverse stations, from 3 to 8 miles apart.

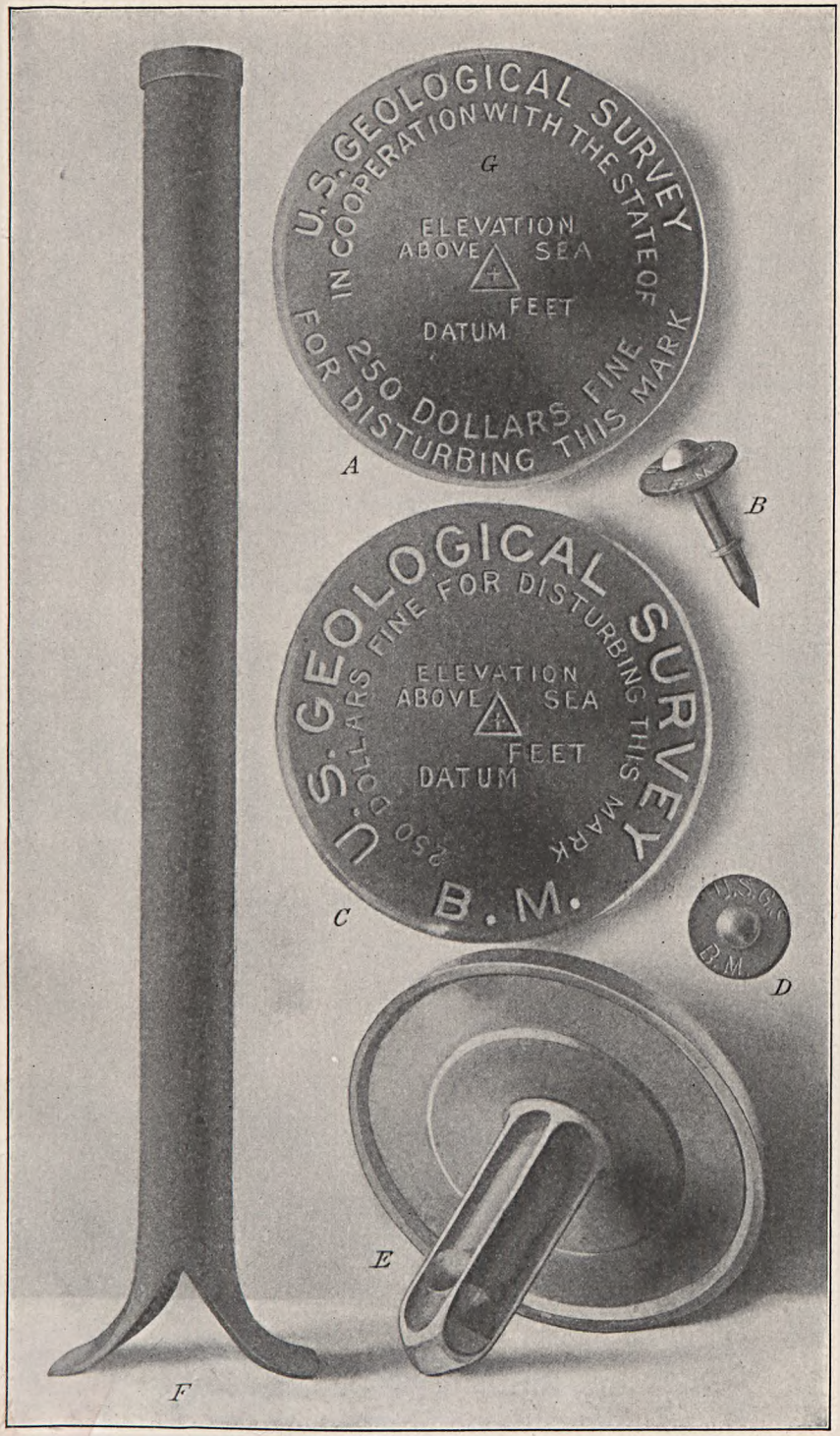
These marks are of the form adopted for leveling bench marks, and in many places the elevation as well as the latitude and longitude has been determined. The marks are of two forms. The first form is a circular bronze or aluminum tablet (*C* and *E*, Pl. II), $3\frac{1}{2}$ inches in diameter and one-fourth inch thick, having a 3-inch stem, which is cemented in a drill hole in solid rock in the wall of some public build-

ing, bridge, abutment, or other substantial masonry structure. The second form (*F*, Pl. II), set in the ground where no masonry or rock is available, consists of a hollow wrought-iron post 3½ inches in outside diameter and 4 feet long. The bottom is spread out to a width of 10 inches in order to give a firm bearing on the earth. A bronze or aluminum-bronze cap is riveted over the top of the post. The tablets, as well as the caps on the iron posts, are appropriately lettered, and where States have cooperated in the work the fact of such cooperation is indicated by the addition of the State name (*G*, Pl. II).

SUMMARY.

Summary of triangulation and primary traverse, 1913–1915.

Locality.	Triangulation stations.	Traverse stations.
Alabama	.....	143
Arizona-New Mexico	15	.....
California	183	.....
Colorado	98	.....
Colorado-Utah	27	.....
Idaho	47	.....
Idaho-Montana	176	.....
Illinois	.....	873
Illinois-Wisconsin	.....	137
Indiana	.....	45
Iowa	.....	165
Kansas-Nebraska	.....	181
Kentucky	12	106
Louisiana	.....	127
Maine	.....	17
Maryland	.....	197
Michigan	.....	732
Michigan-Indiana	.....	88
Minnesota	.....	338
Minnesota-North Dakota-South Dakota	.....	200
Mississippi	.....	109
Missouri	.....	1,019
Nevada	70	.....
New Jersey-New York-Pennsylvania	11	34
New Mexico	36	.....
New York	16	206
North Carolina	.....	178
Oklahoma	.....	225
Oregon	22	531
Tennessee-Arkansas	.....	105
Texas	35	1,045
Utah	70	.....
Utah-Idaho	25	.....
Vermont	14	.....
Virginia-West Virginia	.....	119
Washington	16	110
West Virginia	50	.....
Wisconsin	.....	237
Wisconsin-Minnesota	.....	89
Wyoming	7	.....
	930	7,356



GEOLOGICAL SURVEY STATION MARKS.

A, Tablet used in cooperating States. The State name is inserted at *G*.
B and *D*, Copper temporary bench mark, consisting of a nail and copper washer.
A, *C*, and *E*, Tablets for stone or concrete structures.
F, Iron post used where there is no rock.

ALABAMA.

PRIMARY TRAVERSE.

Childersburg, Cooks Springs, Leeds, McFall, and Oneonta quadrangles.

ST. CLAIR COUNTY.

The following geographic positions were determined by primary traverse and are based upon positions previously determined by primary traverse (described in Bulletins 245 and 276) upon North American datum.

The work was done by J. R. Ellis in April, 1914.

CHILDERSBURG QUADRANGLE.

Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Vandiver, at southwest corner of Whitefield & Boasher's store, iron post stamped "Prim. Trav. Sta. No. 1077"	33 28 13.7	86 30 50.2	.....
T road north, center of	33 28 50.1	86 29 58.8	5,701
T road south at northwest corner of fence (road south is dim)	33 29 02.0	86 28 47.4	6,165
Mail box in forks of road	33 29 18.6	86 27 30.7	6,717
Pisgah Church, forks of road at Goode Bros.' store, 15 feet north to mail box	33 29 44.9	86 19 49.6	.....

Magnetic declination for north border of quadrangle, 2° 30′ E.

COOKS SPRINGS QUADRANGLE.

Along railroad through center of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Road crossing	33 33 36.2	86 29 59.2	.....
Quarter corner between secs. 6 and 7	33 34 29.3	86 28 23.3	9,729
Brampton, in concrete coping in front of railroad depot; bronze tablet stamped "Prim. Trav. Sta. No. 1, 1914"	33 34 32.7	86 28 20.7	409
Brampton, 0.90 mile east of, under high trestle, public highway crossing	33 34 30.6	86 27 25.2	4,700
Milepost 791, road crossing at	33 34 26.9	86 27 01.2	2,070
Cooks Springs, about 2.80 miles west of, second-class road crossing	33 35 21.8	86 25 40.0	8,839
Cooks Springs, at west end of siding, switch block	33 35 30.1	86 24 35.5	5,518
Cooks Springs, 20 feet north of wagon road on south side of trestle, in top of old brick culvert; bronze tablet stamped "Prim. Trav. Sta. No. 2, 1914"	33 35 31.8	86 23 53.7	3,541
Cooks Springs, road crossing at	33 35 32.6	86 23 47.8	499
Tunnel, east end of	33 35 04.9	86 23 12.2	4,117
Road crossing, 530 feet west of spur	33 35 08.6	86 22 03.0	5,870
Road crossing	33 35 05.6	86 21 20.3	3,622
Milepost 783, road crossing at	33 35 25.5	86 19 54.3	7,551
Eden station, 210 feet west of, road crossing	33 35 14.3	86 18 48.2	5,707
T. 18 S., R. 3 E., quarter corner between secs. 2 and 3	33 35 01.6	86 18 28.7	2,090
Pell City station, 2,200 feet west of, road crossing	33 34 56.3	86 17 35.9	4,498
Pell City station, railroad crossing at	33 35 07.7	86 17 03.3	2,989
Milepost 779, track opposite	33 35 25.9	86 16 11.4	4,750
Milepost 779, about 0.80 mile east of, north and south road crossing	33 35 24.1	86 15 20.8	4,290

COOKS SPRINGS QUADRANGLE—Continued.

Along highways near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T road east, center of	33 36 06.5	86 15 02.4	.....
Pell City, about 2 miles north and 2 miles east of, 400 feet north of intersection of the Pell City-Coal City pike and road south to Seddon, in ledge; bronze tablet stamped "Prim. Trav. Sta. No. 5, 1914, elev. 580"	33 37 05.0	86 15 10.2	5,949
Pike at road north	33 37 12.7	86 15 10.7	785
Junction of pikes, 15 feet north and 20 feet east to elevation 504 on telephone pole	33 39 17.4	86 15 35.9	12,790
Coal City Baptist Church, in north part of Old Broken Arrow Village, at southwest corner, in ledge; bronze tablet stamped "Prim. Trav. Sta. No. 6, 1914, Elev. 575"	33 39 57.8	86 15 59.1	4,525
Seaboard Air Line R. R. crossing	33 40 53.5	86 16 30.2	6,213
Concrete culvert under high trestle	33 40 56.9	86 16 21.6	804
Milepost R. 696, 469 feet south of, east-west road crossing and Seaboard Air Line R. R	33 41 33.8	86 15 46.8	4,754
Switch block at spur	33 42 11.8	86 15 02.9	5,336

Along highway near north border of quadrangle.

Coal station, road crossing west of; line leaves railroad at this point and follows wagon road	33 40 58.9	86 17 13.5	.....
T. 16 S., R. 3 E., quarter corner between secs. 35 and 36	33 41 09.3	86 17 23.3	1,337
Pump house, just west of, on south side of road at T road south; stump	33 41 13.7	86 18 07.0	3,715
Forks of road, junction of Fox Creek and Broken Arrow Creek roads; south corner of old shop	33 41 34.4	86 18 34.4	3,117
Top of hill, elevation 812, at negro house, cross roads	33 42 00.0	86 19 02.4	3,509
Old sawmill site, elevation 729 feet, painted on tree	33 42 27.6	86 19 39.9	4,217
Shoal Creek, center of bridge over	33 42 37.7	86 20 26.6	4,077
Shoal Creek, west side of, 0.3 mile north of Negro Baptist Church, on west side of north and south road, at west end of small bridge, in stone; bronze tablet stamped "Prim. Trav. Sta. No. 8, 1914, Elev. 746"	33 43 01.6	86 20 30.8	2,446
Beaver Valley pike, at T road southeast, 15 feet west to C gate	33 43 44.5	86 20 40.4	4,413
Beaver Valley pike at T road west, 5 feet north and 10 feet east to end of log	33 44 18.4	86 20 23.1	3,718
Large frame church, road opposite	33 44 54.0	86 20 44.7	4,040

Along highway near northwest corner of quadrangle.

Milepost 118, private road crossing at	33 44 14.30	86 29 45.6	.....

Along highways near south border of quadrangle.

T. 18 S., R. 2 E., corner secs. 4, 5, 32, and 33	33 30 08.0	86 26 50.8	.....
Dykes Mill, south end of bridge over Kelley Creek	33 30 16.4	86 26 49.5	857
Crossroads, center of	33 30 24.5	86 25 58.6	4,380
Crossroads, north and south road (second class)	33 31 09.0	86 24 50.6	7,312
Pleasant Grove schoolhouse, 50 feet south of southwest corner, T road north	33 31 27.0	86 24 11.4	3,783
T. 17 S., R. 2 E., center of sec. 26	33 31 27.0	86 24 12.3	74
Forks of road, 350 feet south of, opposite brick chimney of residence, center of north and south road	33 31 10.4	86 23 39.8	3,223
Crossroads, north and south road dim	33 30 46.2	86 23 10.5	3,480
Wolf Creek, about 2 miles south and 1 mile east of, 250 feet north of G. W. Johnson's residence, just north of forks, in ledge; bronze tablet stamped "Prim. Trav. Sta. No. 3, 1914"	33 30 35.0	86 22 10.8	5,186
London, 2 miles north of, center of crossroads	33 30 12.7	86 21 43.2	3,247
Crossroads, at old shop, center of	33 30 03.5	86 21 03.5	3,482
Tps. 18 and 19 S., R. 3 E., corner secs. 2, 3, 34, and 35	33 30 10.7	86 19 32.4	.....
Forks of road, center of box culvert at	33 30 02.3	86 18 46.1	4,009
Easonville, center of crossroads at, 10 feet west to center of bridge	33 31 22.6	86 17 16.1	11,140
Valley pike, at east and west section line	33 31 33.5	86 17 04.6	1,470

COOKS SPRINGS QUADRANGLE—Continued.

Spur line to point near southeast corner of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Forks of road, center of	33 31 45.3	86 15 51.1	6,335
Old Hardwick farmhouse, 300 feet southeast of, at north side of T road north, on south side of large square post, nail in blaze	33 31 12.5	86 15 23.6	4,048
Cropwell, at northwest corner of Robinson & Sons' building; bronze tablet stamped "Prim. Trav. Sta. No. 4, Elev. 478, 1914"	33 33 09.3	86 16 06.7	7,998
Cropwell, in north part of, T road east	33 33 19.1	86 16 04.0	1,015
Intersection of Cropwell-Seddon road and Birmingham & Atlantic R. R.	33 33 32.7	86 15 32.1	3,030

Magnetic declination for north border of quadrangle, 2° 52′ E.; for south border, 2° 30′ E.; for east border, 2° 16′ E.

LEEDS QUADRANGLE.

Along railroad from Leeds to Seddon.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Leeds, 0.6 mile west of, 615 feet west of trestle over East Cahaba River, in limestone 35 feet north of Southern Ry. track; bronze tablet stamped "Prim. Trav. Sta. No. 9, elev. 627 feet"	33 32 53.2	86 32 56.6	.....
Road crossing	33 32 33.9	86 31 32.0	7,422
Mile post C 120, at road crossing 2,020 feet south of, bronze tablet No. 10, cemented in concrete 18 inches below surface of rail in center of track of Alabama Great Southern R. R.; signboard bears S. 76° ½ W., distant 15.5 feet	33 42 25.2	86 30 57.2	.....

McFALL QUADRANGLE.

Along highways near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Seddon, about 0.75 mile west of, center of road crossing, northwest and southeast	33 35 21.3	86 14 43.0	.....
Milepost R. 694, about 700 feet south of, 35 feet north of road crossing, on northeast corner of concrete culvert; cross and "U. S. G. S." cut	33 42 29.1	86 14 15.4	.....
Seddon, about 1 mile south of, center of forks of road	33 34 17.7	86 14 17.3	.....
T. 18 S., R. 4 E., corner secs. 4, 5, 8, and 9	33 34 38.2	86 14 17.4	2,081

Magnetic declination for west border of quadrangle, 2° 16′ E.

ONEONTA QUADRANGLE.

Along highways and railroad near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
St. Clair Springs, about 3 miles east of, T road south, 10 feet north to tall fence post	33 45 37.4	86 21 20.4	.....
Little Canoe Creek, center of middle truss of bridge over	33 45 47.1	86 22 40.8	6,863
Tps. 15 and 16, Rs. 2 and 3 E., corner secs. 1, 6, 31, and 36	33 45 52.9	86 22 35.4	747
St. Clair Springs, about 1 mile east of, intersection of pikes, 5 feet south and 27 feet east to telephone pole	33 45 44.7	86 23 14.6	3,403
St. Clair Springs, T road south, center of, 10 feet south to telephone pole	33 45 46.9	86 24 10.0	4,688
St. Clair Springs, about 1.25 miles west of, 48 feet east to telephone pole No. 67, crossroads	33 46 09.5	86 25 24.8	6,713
Springville, about 2.50 miles northeast of, north-south pike crossing Alabama Great Southern R. R	33 46 54.6	86 25 36.2	4,657
Springville, about 0.70 mile northeast of, road crossing	33 46 46.9	86 27 18.6	8,671
Springville station, opposite semaphore center of track	33 46 28.3	86 27 56.9	3,744
Springville station, 2 miles southwest of, east and west road crossing	33 45 08.3	86 29 10.1	10,180

Magnetic declination for south border of quadrangle, 2° 52′ E.

Goodwater and Weogufka quadrangles.

COOSA, TALLADEGA, AND WEOGUFKA COUNTIES.

The following geographic positions on North American datum were determined by primary traverse in 1914 by J. R. Ellis. They are based on positions described in Bulletins 201 and 276.

WEOGUFKA QUADRANGLE.

From Kahatchee triangulation station of the United States Coast and Geodetic Survey along public highways west to tie at Wilsonville.

Stations.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Kahatchee triangulation station, 4 miles south of Childersburg, on highest point of range of hills, a bottle under a large bowlder	33 13 38.27	86 21 36.53	.....
Forks of road, 0.8 mile northwest of triangulation station	33 14 12.5	86 22 05.5	4,255
J. S. Bryant's mail box at T road east	33 13 44.3	86 23 34.5	8,072
Lee Henderson plantation, at forks of road, at south end of negro cabin, in brick chimney; bronze tablet stamped "Prim. Trav. Sta. No. 9, 1914"	33 13 25.4	86 24 22.4	4,497
Corner sections (no numbers) north and south road at hedge fence west	33 13 31.6	86 24 21.6	640
Wilsonville, center of covered bridge over Kahatchee Creek, 3.5 miles east of	33 14 20.5	86 24 54.6	5,688
Mountain Grove Church, center of T road south at	33 14 13.8	86 25 54.9	5,162
McGowan Ferry, T road south, 0.5 mile east of, 30 feet south and 10 feet east to black oak tree	33 14 15.0	86 27 12.6	6,610
Wilsonville, east and west road crossing Southern Ry., 0.8 mile northeast of	33 14 15.6	86 28 20.4	5,769
Wilsonville, "Prim. Trav. Sta. No. 794"	33 14 04.10	86 29 02.90	.....

From McGowan Ferry south along highways to Fayetteville station, thence along Louisville & Nashville Railroad to tie at Sylacauga.

McGowan Ferry, west end of small bridge at forks of road 1.2 miles south and 0.5 mile east of	33 13 06.7	86 27 02.7	.....
Haye Spring Branch, at north and south road crossing	33 11 33.5	86 26 59.7	9,431
Shady Grove Church, center of crossroads just southeast of	33 10 51.2	86 25 45.6	7,618
Cemetery, crossroads 0.2 mile southeast of	33 10 12.1	86 25 00.6	5,508
Fayetteville, center of T road north at	33 09 19.3	86 24 24.1	6,189
Fayetteville station, corner sections at	33 08 46.4	86 24 23.1	3,333

WEOGUFKA QUADRANGLE—Continued.

Along Louisville & Nashville Railroad.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Fayetteville station, north and south road crossing Louisville & Nashville R. R., about 300 feet east of	33 08 46.7	86 24 19.0	354
Fayetteville station, private road crossing, 0.8 mile east of	33 09 01.5	86 23 33.2	4,170
Milepost 94A, private road crossing, 0.5 mile east of	33 09 23.8	86 22 23.5	6,339
Fayetteville station, 2.5 miles east of, in marble outcrop on north side of Louisville & Nashville R. R., 1,000 feet east of road crossing, 25 feet south and 10 feet west to east end of culvert No. 41; bronze tablet stamped "Prim. Trav. Sta. No. 10, 1914"	33 09 33.2	86 21 55.4	2,568
Milepost 92A, east and west road crossing at	33 09 51.0	86 20 53.2	5,594
Milepost 91A, east and west road crossing, 1,350 feet east of	33 09 45.1	86 19 36.9	6,510
Milepost 90A, road crossing, 300 feet southwest of	33 09 54.0	86 18 56.2	3,577
Gant Junction, road crossing, 30 feet west of semaphore	33 10 04.7	86 17 53.9	5,408
Milepost 88A, private road crossing, 210 feet west of	33 10 05.5	86 16 53.2	5,161
Milepost 87A, north and south road crossing at	33 10 06.3	86 15 49.4	5,432
Sylacauga, crossing of Louisville & Nashville R. R. and Central of Georgia R. R. at	33 10 25.0	86 15 01.9	4,455

From Sylacauga south along highways to point near southeast corner of quadrangle, thence west along south border to Marble Valley and north to Talladega Springs, thence along Louisville & Nashville Railroad to tie at Fayetteville station.

Sylacauga, crossing of Louisville & Nashville R. R. and Central of Georgia R. R.	33 10 25.0	86 15 01.9	.....
T. 23 S., R. 18 E., corner sections at Sylacauga; iron hub	33 10 02.7	86 15 03.4	2,253
Sylacauga, center of T road north, 1 mile south of, 15 feet east and 10 feet south to mail box	33 09 18.9	86 15 09.1	4,457
Sylacauga, center of T road west, 2½ miles south of	33 08 09.0	86 15 17.4	7,090
Sylacauga, 3 miles south of, in ledge of stone on north side of Stewartsville-Sylacauga road, 0.2 mile south of Tanyard branch, 18 feet from center of road; bronze tablet stamped "Prim. Trav. Sta. No. 11, 1914"	33 07 31.4	86 15.15.0	3,803
Stewartsville, northeast corner of store, at forks of road, 2 miles north and 0.5 mile west of	33 06 26.5	86 15 33.0	6,742
Shelton Creek, center of bridge over	33 05 01.4	86 15 13.5	8,758
T. 24 S., R. 18 E., corner secs. 14, 15, 22, and 23	33 03 36.8	86 15 05.7	.....
Mail box No. 39, at T road north	33 01 47.1	86 15 35.2	.....
New Side Baptist Church, well house at forks of road just south of	33, 01, 23.4	86, 16 13.9	4,072
Weogufka, center of crossroads, on top of hill, 1.3 miles east of	33 01 04.6	86 17 21.4	6,054
Weogufka, bridge at middle of Weogufka Creek, 0.5 mile east of	33 01 07.3	86 18 00.6	3,345
Weogufka, center of crossroads at	33 01 00.1	86 18 42.8	3,670
Tps. 24 and 25 S., Rs. 17 and 18 E., corner of, 20 feet south to black oak tree	33 00 58.0	86 19 11.4	2,436
Weogufka, center of crossroads, 1.5 miles west and 0.5 mile south of	33 00 33.0	86 20 12.6	5,791
Weogufka, 3 miles west of and 0.8 mile south of, in east chimney of W. T. Lesley's residence at Unity Church; bronze tablet stamped "Prim. Trav. Sta. No. 13, 1914"	33 00 20.0	86 21 35.4	7,173
Frog poodle crossroads, center of	33 00 23.3	86 21 47.8	1,110
Weogufka, center of crossroads, 5 miles due west of	33 00 48.7	86 23 24.6	8,629
Forks of road at top of hill, dim road to southwest	33 01 04.0	86 24 20.3	4,992
Paint Creek, center of crossroad, 0.5 mile east of	33 02 07.6	86 25 08.0	7,643
Marble Valley, center of bridge over Paint Creek, 1.5 miles east and 0.5 mile south of	33 02 14.0	86 25 33.3	2,182
Marble Valley, in brick chimney of J. W. Morris's residence at; bronze tablet stamped "Prim. Trav. Sta. No. 14, 1914"	33 02 40.2	86 27 01.8	7,991
Marble Valley, center of T road east, 1.5 miles north of and 0.5 mile east of	33 04 01.2	86 26 34.9	8,499
Guide board, "Marble Valley 2 miles," forks of road at, 30 feet south to guide board	33, 04 39.2	86 26 18.1	4,103
Looney Mill, center of T road east at	33 05 24.9	86 26 13.0	4,643
Pickerwood Creek, center of bridge over	33 05 35.1	86 26 43.8	2,816
Talladega-Coosa county line, center of north-south road on	33 06 11.5	86 26 46.0	3,685
Talladega Springs, in concrete coping at spring house; bronze tablet stamped "Prim. Trav. Sta. No. 15, 1914"	33 06 56.6	86 26 34.4	4,674
Talladega Springs station, 1 mile northeast of, northeast and southwest road crossing Louisville & Nashville R. R.	33 07 57.3	86 26 06.2	6,586
Fayetteville station, road crossing east and west, Louisville & Nashville R. R., 0.75 mile southwest of	33 08 30.0	86 25 10.8	5,751
Station 171, tie point	33 08 46.56	86 24 19.08	4,709

Magnetic declination for west half of north border of quadrangle, 2° 24′ E.; for north half of west border of quadrangle, 2° 31′ E.; for south half of west border of quadrangle, 2° 30′ E.; for south half of east border of quadrangle, 2° 57′ E.; for east half of south border of quadrangle, 3° 07′ E.; for west half of south border of quadrangle, 2° 34′ E.

GOOD WATER QUADRANGLE.

Near Stewartsville.

Stations.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Stewartsville, forks of road at, 25 feet south to center of small bridge	33 04 40.3	86 14 50.6	.....
Stewartsville, center of forks of road, 1 mile south of	33 03 51.6	86 14 52.2	4,918
Stewartsville, 3 miles south and 1 mile east of, on west edge of Stewartsville-Hanover road, about 800 feet northeast of forks of road, 17 feet west to blaze on east face of black gum tree, in ledge of stone; bronze tablet stamped "Prim. Trav. Sta. No. 12, 1914"	33 02 29.6	86 13 41.3	.....

NORTH CAROLINA.

PRIMARY TRAVERSE.

Belhaven, Bunyon, Jamesville, and Plymouth quadrangles.

BEAUFORT, MARTIN, AND WASHINGTON COUNTIES.

The following geographic positions on North American datum were determined in 1913 by George T. Hawkins. The line starts from Coast Survey triangulation station Cedar Grove and follows Norfolk Southern Railroad to triangulation station Range South. Circuits are looped from the main line and follow railroads and highways as indicated in the tabulated lists:

BELHAVEN QUADRANGLE.

Along Norfolk Southern Railroad.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Milepost 15, railroad track opposite	35 44 54.4	76 38 01.7	
Wenona blind siding, head block	35 43 51.2	76 38 33.6	6,900
Old Plymouth, road crossing near water tank	35 43 05.0	76 38 56.9	5,050
Pike Road station, railroad track opposite	35 41 43.8	76 39 32.4	8,718
Old log railroad, crossing of	35 40 15.4	76 39 52.2	9,090
Milepost 8, second-class road crossing 2,550 feet south of	35 38 41.4	76 40 13.2	9,660
Milepost 7, Norfolk Southern R. R. crossing, drainage ditch 1,150 feet south of	35 38 03.5	76 40 21.7	3,900
Bishop, 10 feet east of railroad and 15 feet south of wagon road, 110 feet north of railroad station and 60 feet west of old store, iron post stamped "Prim. Trav. Sta. No. 3, 1913"	35 36 39.0	76 40 40.4	8,680
Wilkins station, road crossing 300 feet east of	35 36 27.3	76 42 01.3	6,780
Second-class road crossing, 70 feet southeast to gate	35 36 21.8	76 42 57.1	4,640
County road crossing, 50 feet northwest to crossing sign	35 36 13.5	76 44 22.0	7,061
Pantego station, road crossing 400 feet southeast of	35 35 28.9	76 39 40.3	[a] 8,650
Milepost 2, road crossing 1,800 feet southeast of, 15 feet south to crossing sign	35 34 14.2	76 38 43.7	8,886
Belhaven, road crossing 1 mile west of	35 33 07.6	76 38 16.4	7,110
Belhaven, in northwest corner of railway reservation northeast of station, U. S. drainage bench mark iron post	35 32 24.1	76 37 25.4	6,090

Along highways.

Belhaven crossing, Main and Haslin streets	35 32 24.5	76 37 24.2	110
Second-class crossroad, 20 feet northwest to 2 mail boxes	35 32 59.4	76 36 14.5	6,755
Three corners, 50 feet southwest to negro cabin, 260 feet southeast to old store	35 33 36.4	76 34 39.6	8,690
T road south, 10 feet north to N. W. Sadler's mail box	35 33 35.4	76 33 58.0	3,440
T road south, 40 feet southwest to old store	35 33 26.8	76 33 09.0	4,144
Leechville, 1½ miles west of, at T road north, 14 feet west to J. R. Green's mail box, 45 feet southeast to northwest corner of cabin, 15 feet north to east and west road; iron post stamped "Prim. Trav. Sta. No. 5, 1913"	35 33 53.7	76 32 04.9	5,946
Small wooden bridge, three corners at	35 34 29.1	76 32 04.7	3,580
14-inch pine, blazed on east and west; nail in each blaze	35 35 48.3	76 33 53.0	12,010
Forks of road, 20 feet east to sign, "Pungo 8 miles, Leechville 5 miles"	35 35 47.8	76 34 02.7	800
Mr. Swindell's residence, well in front of	35 36 12.1	76 34 40.5	3,971
Gate, road opposite	35 36 38.4	76 35 19.0	4,144
Forks of road, dim road northeast	35 37 39.3	76 36 17.7	7,836
Forks of road, dim road southeast	35 37 57.0	76 36 35.4	2,305
Forks of road, 120 feet south to sign, "Pantico 4 miles, Pikewood 7 miles"	35 38 01.0	76 36 44.5	853

[a] Distance from station at Bishop.

BELHAVEN QUADRANGLE—Continued.

Along highways—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
County road crossing drainage ditch	35 38 57.3	76 36 36.4	5,733
Forks, second-class road west, 40 feet north to mail box, 150 feet southeast to 2-story frame house	35 39 14.0	76 36 48.5	1,955
Forks, second-class road at white race church	35 39 54.3	76 36 34.0	4,255
Pungo post office, road opposite	35 40 35.8	76 37 13.7	5,322
T road north at white race schoolhouse	35 40 57.6	76 37 43.7	3,316
T road west, 150 feet northwest to 2-story house	35 41 58.0	76 38 07.1	6,400
County road crossing drainage ditch	35 42 40.9	76 38 33.2	4,840
Wenona, 300 feet east of Norfolk Southern Ry. on north side of old Plymouth road, stamped "Prim. Trav. Sta. No. 6, 1913," 10 feet north of center of road and 3 feet south of ditch	35 43 02.8	76 38 54.6	2,830
Old Plymouth road crossing Norfolk Southern R. R.	35 43 05.0	76 38 56.9	300
Three corners at church	35 35 05.8	76 40 10.3	.....
T road west at store	35 34 24.6	76 41 20.5	7,137
Second-class road fork northwest	35 33 59.9	76 41 49.7	3,467
T road southeast, 50 feet south to 2-story house	35 32 42.6	76 42 17.3	8,142
T road southeast, 20 feet north to sign, "Washington 23 miles, Pantego 5 miles"	35 32 25.1	76 42 31.5	2,118
T road northwest, at old store	35 32 00.9	76 43 36.5	5,904
Yeatesville, three corners at, 40 feet north to store	35 31 42.2	76 44 26.0	4,502
Yeatesville, on north side east and west road, 600 feet west of 3 corners, 60 feet northwest of Mr. Woolard's house, 40 feet northeast of small house; iron post stamped "Prim. Trav. Sta. No. 7, 1913"	35 31 42.3	76 44 33.7	636

BUNYON QUADRANGLE.

Along Norfolk Southern Railroad.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Cedar Grove, on sandy point on north side of Pamplico River 1 mile southeast of Washington; it is the next point above Austin Point and 1 mile distant; 1½-inch iron pipe driven in the ground; the station is now about 10 feet from the shore line, in water near 3 feet deep; reference mark, cypress stump, 19.6 feet from station, at water's edge	35 31 52.58	77 02 10.99	.....
River Road station, road crossing	35 32 07.2	76 59 16.4	14,500
Bunyon station, road crossing 500 feet south of	35 32 13.1	76 58 31.2	3,786
Hall Swamp station, road crossing	35 33 00.8	76 57 09.2	8,320
Alligoods station, road crossing	35 33 29.6	76 56 19.6	5,030
Slatestone station, road crossing	35 34 17.3	76 54 57.0	8,350
Milepost 117, railroad track opposite	35 34 34.0	76 54 10.6	4,193
Walla Watta station, north-south road crossing at	35 35 09.4	76 52 26.9	9,280
Milepost 114, road crossing northeast and southwest, 250 feet south of	35 35 59.2	76 51 58.0	5,575
Pinetown, 54 feet northwest of the northwest corner of station, 30 feet north of northeast corner of frame house, 11 feet west of west rail of main line Norfolk Southern R. R. and 16 feet north of railway crossing; iron post stamped "Prim. Trav. Sta. No. 1, 1913"	35 36 37.2	76 51 52.3	3,870
Mileposts 110 and 111, well-traveled road crossing between	35 38 54.4	76 51 31.6	13,970
Milepost 109, railway track opposite	35 40 19.2	76 51 11.6	8,737
Mizell station, road crossing at	35 41 37.5	76 50 28.0	8,690
Mizell station, road crossing 1 mile northeast of	35 42 15.9	76 49 47.8	5,100
Hoke station, road crossing at	35 43 57.5	76 48 48.0	11,400
Milepost 103, railway track opposite	35 44 52.2	76 48 11.4	6,300
Terracia station, road crossing at	35 36 04.3	76 45 55.4	.....
Stevens station, road crossing drainage ditch at	35 35 58.1	76 46 58.3	5,231
Log Spur, head block	35 35 50.4	76 48 17.0	6,550
Acre station, road crossing at east end of	35 35 43.9	76 49 26.2	5,747
Second-class road crossing, 150 feet south to white house, 30 feet north to county road	35 36 14.1	76 50 46.3	7,288
Prim. Trav. Sta. No. 1 (described above)	35 36 37.2	76 51 52.3	5,953

BUNYON QUADRANGLE—Continued.

Along highways.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T road south, signpost 20 feet southeast reads "Bath 5½ miles"	35 31 42.0	76 45 08.8	.....
T road north at old store, 100 feet northwest to two-story house	35 31 46.2	76 46 34.7	7,112
Three corners, on east bank of drainage ditch	35 31 37.4	76 47 21.4	3,956
Crossroads, 200 feet southwest to large house 60 feet northeast to small house	35 31 28.8	76 48 00.3	3,334
Hunter's bridge, four corners	35 31 19.0	76 48 35.3	3,053
Crossroads, 400 feet south to white schoolhouse, 20 feet southeast to signpost	35 31 23.8	76 50 33.4	9,770
Crossing of county road and narrow-gage railroad	35 31 32.0	76 51 49.2	6,320
On north side of east and west road, 60 feet west of T road north, 15 feet southeast to mail box, 68 feet west to mail box, 300 feet north to two-story house; iron post stamped "Prim. Trav. Sta. No. 8, 1913"	35 31 32.0	76 52 21.8	2,700
Three corners, 20 feet northwest to signpost "Plymouth road 3½ miles"	35 31 28.1	76 53 04.1	3,512
Three corners, 100 feet north to 200 feet southeast to house	35 30 42.5	76 54 01.0	6,584
Second-class crossroad	35 31 06.0	76 55 27.5	7,535
County road crossing narrow-gage road	35 31 31.9	76 56 32.6	5,984
T road southwest, 30 feet south to old store	35 31 53.8	76 57 55.0	7,155
Bunyon station, road crossing 500 feet south of	35 32 13.1	76 58 31.2	3,577

JAMESVILLE QUADRANGLE.

Along Norfolk Southern Railroad, Hinson to Plymouth.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Hinson, 12 feet west of west rail main line Norfolk Southern R. R., 20 feet south of station, 21 feet southwest of southwest corner of station, and 10 feet northeast of pine tree; iron post stamped "Prim. Trav. Sta. No. 2, 1913."	35 45 47.6	76 47 34.4	.....
Milepost 101, railroad track opposite	35 46 15.0	76 46 58.6	4,045
Milepost 100, railroad track opposite	35 46 44.5	76 46 05.8	5,285
Reno station, railroad track opposite	35 48 14.0	76 45 52.1	9,120
Mileposts 96 and 97, county road crossing between	35 49 24.2	76 45 29.3	7,347
Milepost 95, county road crossing, 700 feet northwest of	35 50 53.4	76 45 36.0	9,030
Plymouth, U. S. C. S. north meridian stone	35 51 40.2	76 45 14.1	5,070
Jones's value for north meridian stone (not adjusted to this value)	35 51 41.9	76 45 14.1	.....

PLYMOUTH QUADRANGLE.

Along Norfolk Southern Railroad.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Milepost 91, road crossing, 1,400 feet southwest of	35 51 56.8	76 43 37.6	.....
Waters station, second-class road crossing	35 53 14.9	76 43 03.2	11,080
Westover station, railway track opposite	35 54 02.9	76 40 42.3	8,234
County road crossing	35 54 28.9	76 39 26.7	6,750
County road crossing, 200 feet southeast to church	35 55 09.8	76 37 46.7	9,205
Main line Norfolk Southern R. R., on projected line of tangent from south on Belhaven branch	35 55 42.6	76 36 58.9	5,146
Range South, U. S. C. S. triangulation station at the south end of the Albemarle Sound bridge, Norfolk Southern R. R., between 2 tracks and 575 feet southwest of the end of the bridge; station mark, a small brass bolt in center of top of large block of cement 1 foot square on top, buried flush with ground	35 56 19.20	76 36 14.05	.....
Mileposts 26 and 27, Belhaven branch Norfolk Southern R. R.	35 53 54.6	76 37 27.0	[a] 11,160
Roper, main street crossing railway	35 52 40.0	76 36 55.5	7,983
Mileposts 23 and 24, second-class road crossing between, 300 feet east to negro cabin	35 51 43.2	76 36 17.8	6,522
Milepost 22, railroad track opposite	35 50 36.1	76 35 45.6	7,290
Milepost 21, railroad track opposite	35 49 45.0	76 35 36.6	5,213
Milepost 20, railroad track opposite	35 48 56.3	76 35 59.2	5,264
Milepost 19, railroad track opposite	35 48 08.2	76 36 23.6	5,260
Milepost 18, railroad track opposite	35 47 19.7	76 36 48.2	5,311
Milepost 17, railroad track opposite	35 46 31.4	76 37 12.6	5,280
Railroad siding, head block at south end of	35 45 35.6	76 37 40.9	6,110

[a] Distance from main line.

Belhaven, Bunyon, and Plymouth quadrangles.

BEAUFORT AND WASHINGTON COUNTIES.

Positions on approximate North American datum determined from notes of John L. Roper Lumber Co., Land Reclamation Department, which have common points with U. S. Geological Survey primary traverse line. Line follows highways from points on traverse line at Plymouth described in Bulletin 181 and is tied to traverse line at Acre. Line was run in 1913 and computed in 1915.

PLYMOUTH QUADRANGLE.

Along highways near southwest border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Plymouth, milepost 92	35 51 41.9	76 44 21.1	.....
Plymouth, ½ mile south of; forks of road at cemetery	35 51 21.6	76 44 39.6	2,553
Plymouth, 1 mile south of; bench mark in 15-inch water oak	35 50 57.4	76 44 45.3	2,500
Plymouth, 1½ miles south of; bench mark in 20-inch poplar	35 50 31.6	76 44 24.7	3,110
Plymouth, 2½ miles south of; bench mark in 6-inch gum tree	35 49 49.2	76 44 12.2	4,414
Plymouth, 3 miles south of, bench mark in 8-inch oak tree	35 49 23.6	76 44 06.9	2,623
Plymouth, 4 miles south of; bench mark in 15-inch gum tree, near schoolhouse	35 48 41.0	76 44 04.1	4,320
Plymouth, 4¾ miles south of; bench mark in 6-inch pine tree near Mr. Bateman's house	35 47 57.9	76 43 23.9	5,472
D. G. Darden's house; crossroads near	35 47 42.3	76 43 25.6	1,580
D. G. Darden's house, ¼ mile south of; bench mark in 6-inch gum tree	35 47 27.0	76 43 27.3	1,554
D. G. Darden's house, road southwest, 1 mile southwest of	35 46 49.7	76 43 47.6	4,120
Bench mark in 24-inch oak tree near house	35 46 19.4	76 44 02.0	3,290
County road crossing drainage ditch	35 46 06.0	76 44 10.8	1,536
Near where road crosses drainage ditch; bench mark in 15-inch pine tree	35 45 47.6	76 44 13.5	1,874
Schoolhouse, 650 feet north of; bench mark No. 404, in 24-inch oak tree	35 45 33.5	76 44 17.4	1,460

BELHAVEN QUADRANGLE.

Near northwest corner of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Plymouth, road crossing Hollis road; bench mark in 12-inch pine near	35 44 46.3	76 44 30.9	.....
Plymouth, road crossing drainage ditch at edge of woods	35 44 23.1	76 44 27.9	2,360
U. S. B. M. "F 33," at edge of swamp	35 44 05.7	76 44 36.3	1,890
U. S. B. M. "F 32," 500 feet northeast of L. G. Nange's house	35 43 43.6	76 44 53.0	2,625

BUNYON QUADRANGLE.

Along highways in east part of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Acre, county road crossing railway	35 35 44.1	76 49 26.3	(*a*)
Acre, 1 mile north of three corners	35 36 30.2	76 49 07.5	4,917
Acre, 2.5 miles northeast of; bench mark in 10-inch pine tree	35 37 44.7	76 48 28.0	8,205
D. L. Harris's house, U. S. B. M. 600 feet north of	35 38 11.2	76 48 18.6	2,795
B. T. Bowen's house, four corners, 100 feet southwest of	35 39 15.0	76 47 45.3	7,014
Milepost "To Plymouth 15 miles," 1,500 feet north of H. A. Bowen's house	35 40 11.2	76 47 17.7	6,120
J. T. Bownes's house, U. S. B. M. 600 feet northeast of	35 40 30.6	76 47 04.1	2,265
Milepost, "To Plymouth 14 miles"	35 40 58.0	76 46 47.4	3,090
U. S. Harris's house, U. S. B. M. near	35 41 06.0	76 46 41.0	965
Acre Chapel, U. S. B. M. near	35 41 43.0	76 46 18.9	4,165
Acre Chapel, 50-inch oak 1.25 miles northeast of	35 42 23.8	76 45 45.7	4,950
G. L. Bowen, U. S. B. M. "F 31" near	35 42 55.5	76 45 22.8	3,720

a Uncertain location.

Ayden and Kinston quadrangles.

GREENE AND LENOIR COUNTIES.

The following geographic positions on approximate North American datum were determined in 1913 by George T. Hawkins. The positions are based on the corrected value of Grainger station, published on page 146, Bulletin 181.

A circuit was completed by using the traverse line run by Oscar Jones in 1900 from Grainger station along Atlantic Coast Line Railroad to Kinston, thence along Norfolk Southern Railroad to road crossing 280 feet east of milepost 78, thence north along highways to Snow Hill by Hawkins in 1913, thence east along highways from Snow Hill to Ridge Springs by Sledge Tatum in 1902, thence south along highways to Grainger by Hawkins in 1913, the closure error of the circuit being 1.74″ in latitude and 1.12″ in longitude.

The positions of points along Jones line from Grainger to milepost 78 as published on pages 144–146, Bulletin 181, are changed but slightly.

The latitudes of points along Tatum's line from Snow Hill to Ridge Springs (p. 41, Bulletin 201) are increased 4.3″ at Snow Hill and 2.8″ at Ormondsville; the longitudes are changed but a few tenths of a second.

KINSTON QUADRANGLE.

Along railroads from Grainger to milepost 78.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Grainger, railway opposite telegraph window	35 19 10.8	77 30 32.0	.....
Grainger, 6 feet south of post office, 27 feet east of center of highway, 126 feet east of north rail of Atlantic Coast Line R. R.; iron post stamped "77 Raleigh, Prim. Trav. Sta. No. 11, 1913"	35 19 09.6	77 30 30.8	148
Kinston, crossing of Atlantic Coast Line and Norfolk Southern railroads	35 15 31.3	77 34 27.2	29,530
Kinston, railway opposite telegraph window of Norfolk Southern R. R. station	35 15 51.2	77 34 53.8	2,990
Kinston, road crossing 3 miles west of	35 16 15.7	77 38 12.6	16,670
Falling Creek, railway opposite station	35 16 34.8	77 41 23.4	15,940
Milepost 78, road crossing 280 feet east of	35 17 08.6	77 44 06.4	13,940
Milepost 78, road crossing 280 feet east of, 15 feet northeast of, 13 feet of north rail and 2 feet northeast of crossing signpost; iron post stamped "Prim. Trav. Sta. No. 12, 1913"	35 17 08.7	77 44 06.3	15
Along highways.			
Three Corners, in front of large white house 60 feet north to artesian well, 30 feet north to hydraulic vane	35 18 54.0	77 43 48.2	10,780
Three Corners, 40 feet south to post oak between two roads	35 19 30.7	77 42 46.0	6,350
Crossroads, 30 feet northeast to corner of wire fence	35 20 36.5	77 42 33.1	6,750
Institute, T road west in south part of	35 21 14.6	77 42 46.2	4,010
Institute, ¾ mile north of, 30 feet southwest to crossroads, 110 feet northeast to southwest corner of two-story house, 20 feet east of north and south road and 15 feet north of east and west road; iron post stamped "Prim. Trav. Sta. No. 13, 1913"	35 21 59.4	77 42 59.2	4,665
Three Corners, 30 feet southeast to mail box, 150 feet northeast to new house	35 23 04.3	77 42 43.9	6,690
Crossroads, 20 feet north to corner of wire fence, first-class roads north, south, and west, second-class road east	35 23 24.9	77 42 23.5	2,687
Arbor, T road west at, 30 feet northeast to store, 70 feet southwest to church	35 24 04.3	77 42 08.0	4,194

KINSTON QUADRANGLE—Continued.

Along highways—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Crossroads, 20 feet northeast to signpost "To Lug mill road 2 miles"	35 25 42.8	77 41 28.3	10,495
Crossroads, 40 feet south to signpost "To Snow Hill 1 mile"	35 26 51.9	77 41 22.0	7,012
Snow Hill, courthouse dome	35 27 21.9	77 40 13.0	6,460
Snow Hill, in wall at north side of entrance to county courthouse; aluminum tablet stamped "64 RALEIGH, Prim. Trav. Sta. No. 14, 1913"	35 27 22.0	77 40 13.1	12
Snow Hill, country road opposite entrance to courthouse	35 27 22.1	77 40 13.4	30
Snow Hill, 1.5 miles northeast of, road left	35 28 48.9	77 38 51.1	11,110
Snow Hill, 2 miles northeast of, road left	35 28 56.9	77 38 15.4	3,063
Snow Hill, 2.5 miles northeast of, road left	35 28 51.6	77 37 46.4	2,456
Dixonville post office	35 28 18.3	77 36 35.6	6,760
Dixonville, 1 mile east of, road right	35 28 25.6	77 35 17.9	6,470
Dixonville, 2 miles northeast of, road left	35 29 07.6	77 35 05.7	4,370
Road left	35 29 02.9	77 34 22.0	3,658
Ormondsville, crossroads at	35 28 17.1	77 32 45.3	9,232
Ridge Springs, road right, 2 miles northwest of	35 27 55.8	77 31 00.8	8,913
Crossroads, near white church, 20 feet southwest to large oak	35 24 35.9	77 30 01.5	.....
Second-class road, fork to east	35 23 51.8	77 30 01.0	4,447
Grainger, 5 miles north of, 20 feet northeast of T road north, 18 feet east of north and south road, 20 feet north of east and west road, 6 feet east to Pine, 15 feet southeast to Pine; iron post stamped "Prim. Trav. Sta. No. 9, 1913"	35 23 03.6	77 30 13.1	4,975
Three Corners, 30 feet south to mail box No. 48	35 22 00.2	77 30 42.3	6,840
T road east, 10 feet northeast to mail box No. 94	35 21 19.4	77 30 14.6	4,710
Old Church, three corners near, 60 feet north to southwest corner of graveyard	35 20 14.1	77 30 13.9	5,583
Grainger station	35 19 10.8	77 30 32.0	7,550

Magnetic declination on east border of quadrangle, 3° 15′ W.; on west border, 3° 00′ W.

AYDEN QUADRANGLE.

Near Ridge Springs.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Ridge Springs, post office	35 27 25.3	77 29 18.9	.....
Ridge Springs, post office, 45 feet south and 32 feet east of entrance; iron post stamped "Prim. Trav. Sta. No. 10, 1913"	35 27 24.8	77 29 18.5	55
Ridge Springs, 2 miles south of; T road west, 20 feet northwest to 2 mail boxes, 150 feet northwest to large bell	35 25 40.8	77 29 44.7	10,730

ARIZONA AND NEW MEXICO.

TRIANGULATION STATIONS.

Mogollon, Nutrioso, and Reserve quadrangles.

APACHE AND GREENLEE COUNTIES, ARIZ.; SOCORRO COUNTY, N. MEX.

In the winter of 1913–14 C. B. Kendall extended triangulation control for the Reserve quadrangle, N. Mex., from stations Mogollon, Sunset, and Pleasant, described in Bulletins 201 and 551. He occupied five new stations and located five points by intersections all based on North American datum. Additional control work was done in the Patterson quadrangle in 1915 by Mr. Kendall, but final computations have not yet been made.

ESCADILLO, APACHE COUNTY, ARIZ.

On the highest point of the Escadillo Mountain, about 10 miles northwest of Luna and about 8 miles east of Nutrioso. Station can be easily found, as a Forest Service lookout tower, 40 feet high and very solid, was used to observe from. Can be best reached from the west by trail from Nutrioso, from south by Forest Service trail from Bush Valley, and from east by trail from the "E. L. C." ranch. The mountain is heavily timbered, but the tower affords a good view in all directions, except a small segment to the north. The station is on the west side of the mountain and on the second hill from the north end. A ranger's cabin is on the east slope in saddle between the two hills and about 0.5 mile northeast of station.

Signal: Center of tower over which was erected a flag.

Station mark: A bronze triangulation tablet in large bowlder set in ground directly under center pole of tower.

[Latitude 33° 56′ 50.81″. Longitude 109° 07′ 16.99″.]

To station —	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Sunset	6 09 03.68	186 05 33.56	4.9638596	57.175
Fox	249 16 18.98	69 30 17.81	4.6139437	25.544
Apache	269 39 40	89 56 26	4.66524	28.747
Tularosa	300 35 52.42	120 54 03.64	4.7685262	36.465
Box	300 57 06.05	121 07 18.99	4.5183765	20.499
Turner Peak	312 10 13	132 12 48	3.98353	5.984
Brushy Mountain	343 04 07	163 08 08	4.58510	23.903
Whiterocks	351 37 30.81	171 40 06.81	4.6971698	30.941

SUNSET, GREENLEE COUNTY, ARIZ.

Situated 6 miles northeast of town of Clifton, on mountain locally known as Sunset Mountain. Wagon road from Clifton to old slaughter corral on Limestone Wash about 2 miles above its mouth, thence good trail taking left hand (to north) to gap east of station, thence dim trail to station.

Station mark: A bronze triangulation tablet cemented in solid rock over which is built a cairn 6 feet in diameter and 7 feet high.

[Maricopa datum: Latitude 33° 07′ 15.81″; longitude 109° 13′ 40.22″. United States standard datum: Latitude 33° 07′ 21.16″; longitude 109° 13′ 37.30″.]

To station —	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Guthrie [a]	17 20 47.78	197 17 57.00	4.4367053	.....
Guthrie [b]	17 20 20.55	197 17 29.86	4.4366440	16.982
Bryce [a]	74 49 16.71	254 34 42.17	4.6344900	.....
Bryce [b]	74 48 52.49	254 34 18.03	4.6344384	26.778
Morenci [a]	78 17 48.4	258 12 38.10	4.1774160	.....
Pleasant [a]	233 35 23.45	53 44 52.30	4.5235914	.....
Pleasant [b]	233 35 03.06	53 44 31.87	4.5235652	20.745
Mogollon [a]	254 12 01.18	74 32 48.81	4.7873988	.....
Mogollon [b]	254 11 32.77	74 32 20.25	4.7873376	38.079
Canyon [a]	276 51 41.38	97 16 44.58	4.8571778	.....
Canyon [b]	276 51 14.01	97 16 17.43	4.8571186	44.717
Line [a]	324 17 52.14	144 25 23.59	4.5676142	.....
Line [b]	324 17 24.91	144 24 56.41	4.5675529	22.956
Secho [a]	340 45 48.18	160 54 03.87	4.8602010	.....
Secho [b]	340 45 20.95	160 53 36.79	4.8601397	45.029
Escadillo [b]	186 05 33.56	6 09 03.68	4.9638596	57.175
Whiterocks [b]	202 00 09.62	22 06 12.80	4.6585718	28.309
Tularosa [b]	224 21 35.98	44 43 04.81	4.9358163	53.601
Pleasant [b]	233 35 03.06	53 44 31.87	4.5235652	20.745
Grouse [b]	244 11 34	64 28 14	4.72275	32.818
Mogollon [b]	254 11 32.77	74 32 20.25	4.7873376	38.079

[a] Maricopa datum. [b] United States standard datum.

APACHE, SOCORRO COUNTY, N. MEX. **(Not occupied; sighted from five stations.)**

In T. 4 S., R. 17 W., near corner secs. 21, 22, 27, and 28, approximate. On the west end of the Apache Mountain, about 3 miles southeast of the Jewett ranger station and 7 miles northwest of the village of Aragon. Can be easily reached from the Jewett ranger station.

Station mark and signal: An oak tree 15 feet high carrying flag and around tree was built a quodripod of poles.

[Latitude 33° 56′ 55.88″. Longitude 108° 37′ 15.57″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Whiterocks	38 30 16	218 16 12	4.79960	39.170
Box	46 29 14	226 22 43	4.39613	15.470
Escadillo	89 56 26	269 39 40	4.66524	28.747
Fox	151 36 39	331 33 50	4.21161	10.115
Tularosa	352 14 35	172 16 04	4.48336	18.911

BEARWALLOW, SOCORRO COUNTY, N. MEX. **(Not occupied; sighted from four stations.)**

On Bearwallow Mountain of the Mogollon Range, about 8½ miles northeast of the town of Mogollon, at the head of Copper Creek on the west and Gilita Creek on the east.

Signal and station mark: Center of United States Forest Service lookout tower, about 40 feet high.

[Latitude 33° 26′ 58.60″. Longitude 108° 40′ 06.18″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Pleasant	56 48 38	236 39 44	4.47816	18.686
Whiterocks	99 48 10	279 35 45	4.54834	21.963
Tularosa	198 37 06	18 40 08	4.42536	16.547
Mogollon	340 36 52	160 39 20	4.31965	12.972

BOX, SOCORRO COUNTY, N. MEX.

On the east end of the San Francisco Range, locally known as the South Mountain. About 8 miles north and 3 miles west of Reserve. It is in the northwest part of T. 6 S., R. 19 W., about 3 miles southeast of the junction of Rio San Francisco and the S. A. Creek, and 1 mile northeast along ridge from a point where trail from the S. A. ranch to Reserve crosses summit. Station is about 2 miles southwest of a point where the Rio San Francisco goes into a canyon locally known as "The Box," from which station derives its name.

Signal: Flag in top of pine tree, 11.4 feet distant, true azimuth from station mark 156° 54′.

Station mark: A bronze triangulation tablet set in solid rock.

[Latitude 33° 47′ 38.75″. Longitude 108° 48′ 57.20″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Whiterocks	33 15 11.08	213 07 37.37	4.5859557	23.950
Escadillo	121 07 18.99	300 57 06.05	4.5183765	20.499
Apache	226 22 43	46 29 14	4.39613	15.470
Tularosa	300 18 50.28	120 26 48.54	4.4098781	15.967

BRUSHY MOUNTAIN, SOCORRO COUNTY, N. MEX. (Not occupied; sighted from four stations.)

In the southwest part of T. 8 S., R. 21 W., on the west side of the Pueblo Creek, about 7 miles north and 2 miles east of Whiterocks Mountain.

Signal and station mark: Highest point of mountain.

[Latitude 33° 36′ 56.21″. Longitude 109° 00′ 02.51″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Whiterocks	17 39 26	197 38 03	4.11618	8.120
Escadillo	163 08 08	343 04 07	4.58510	23.903
Tularosa	260 04 26	80 18 32	4.60118	24.804
Pleasant	350 34 56	170 36 59	4.54866	21.979

FOX, SOCORRO COUNTY, N. MEX.

In sec. 4 (approximate), T. 3 S., R. 18 W., on the highest point of the "Fox" Mountain and is a high round bare peak overlooking the country for miles in every direction. Several canyons head against the peak, viz, Perry Lawson southeast, American northwest, and Des Meter northeast. It is about 3 miles west of the Jewett Gap and 10 miles northwest of the Jewett ranger station and N. H. ranch. It is an excellent natural triangulation station, as it overlooks the American, Salt Lake, and Agua Frio valleys and the Johnson Basin. It is easily ascended by following Forest Service trail from Jewett Gap.

Signal: Rock cairn 4 feet high around which was built a quodripod of poles. A bushy pine was set over center.

Station mark: A bronze triangulation tablet set in 6 by 8 by 24 inch stone buried in ground over which was built a rock cairn 4 feet high.

[Latitude 34° 04′ 40.51″. Longitude 108° 42′ 17.41″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Whiterocks	26 17 06.92	206 05 49.17	4.8514387	44.135
Turner Peak	56 21 22	236 09 59	4.57648	23.434
Escadillo	69 30 17.81	249 16 18.98	4.6139437	25.544
Apache	331 33 50	151 36 39	4.21161	10.115
Tularosa	345 02 13.01	165 06 30.19	4.6630428	28.602

GROUSE, SOCORRO COUNTY, N. MEX. **(Not occupied; sighted from four stations.)**

On the highest point of Grouse Mountain of the Mogollon Range, in T. 11 S., R. 18 W., near line between secs. 20 and 21, approximate. Station is a quarter of a mile north of trail leading from the Tennessee Cabin to Apache Spring at a point 3 miles east of the Tennessee Cabin.

Station mark and signal: A 35-foot pine tree trimmed and carrying flags and targets. Space around tree was cleared.

NOTE.—This station was built to be occupied later and a triangulation tablet was set in an 8 by 8 by 30 inch stone over which a small rock cairn was built, but as snow prevented occupying it, no angles or distance was taken from it to the signal tree. The tablet is about 30 feet northeast of tree.

[Latitude 33° 19′ 43.68″. Longitude 108° 42′ 59.01″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Sunset	64 28 14	244 11 34	4.72275	32.818
Pleasant	81 33 38	261 26 19	4.32053	12.998
Whiterocks	122 33 29	302 22 41	4.55660	22.385
Mogollon	299 08 57	119 12 59	4.11535	8.104

MOGOLLON, SOCORRO COUNTY, N. MEX.

Situated on highest peak of the Mogollon Range, locally known as Baldy, about 10 miles north of Farquar's ranch on Mogollon Creek. Bare on south and southwest slopes; east and north slopes timbered.

Station mark: A bronze triangulation tablet cemented in triangular stone about 18 by 14 by 14 inches, set 10 inches in the ground. Underneath stone on center a "30 caliber Government" cartridge shell is driven in ground. A cairn 4 feet high was built over mark.

[Maricopa datum: Latitude 33° 16′ 11.72″; longitude 108° 35′ 41.44″ U. S. standard datum: Latitude 33° 16′ 17.27″; longitude 108° 35′ 38.88″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Cliff [a]	2 44 28.60	182 43 54.08	4.5353289	21.315
Line [b]	39 02 56.22	218 49 45.46	4.7769400	.....
Line [a]	39 02 28.27	218 49 17.70	4.7768804	37.173
Sunset [b]	74 32 48.81	254 12 01.18	4.7873988	.....
Sunset [a]	74 32 20.25	254 11 32.77	4.7873376	38.079
Jordan [a]	250 49 43.88	70 61 50.16	4.5584409	22.480
Chalk [a]	293 14 02.62	113 21 15.92	4.3480791	13.849
Copperas [a]	295 42 26.24	115 55 19.16	4.6088055	25.244
Black [a]	314 44 05.77	134 58 15.11	4.7551806	35.361
Canyon [b]	334 04 18.19	154 08 38.08	4.4502461	.....
Canyon [a]	334 03 49.29	154 08 09.24	4.4501926	17.520
Grouse [a]	119 12 59	299 08 57	4.11535	8.104
Whiterocks [a]	121 43 12.63	301 28 22.73	4.6908202	30.491
Bearwallow [a]	160 39 20	340 36 52	4.31965	12.972
Tularosa [a]	182 03 42.39	2 04 17.05	4.6532044	27.961

[a] U. S. standard datum. [b] Maricopa datum.

PLEASANT, SOCORRO COUNTY, N. MEX.

Situated on highest point of Brushy Mountain about 3 miles due west from Pleasanton. Brush and timber cleared from summit in 1901. Easily ascended from San Francisco River at Pleasanton via lane to west side of river and thence by cattle trail to top of ridge, thence northward to station.

Station mark: A bronze triangulation tablet cemented in bowlder.

[Maricopa datum: Latitude 33° 17′ 57.90″; longitude 108° 56′ 21.62″. U. S. standard datum: Latitude 33° 18′ 03.30″; longitude 108° 56′ 18.82″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Sunset [a]	53 44 52.30	233 35 23.45	4.5235914	
Sunset [b]	53 44 31.87	233 35 03.06	4.5235652	20.745
Canyon [a]	302 40 00.62	122 55 39.16	4.7232391	
Canyon [b]	302 39 34.51	122 55 13.05	4.7231782	32.850
Cliff [b]	320 48 18.53	140 59 01.76	4.6845221	30.052
Bullard [a]	330 10 35.08	150 23 41.25	4.8784318	
Bullard [b]	330 10 09.78	150 23 16.03	4.8783710	46.959
Whiterocks [a]	156 33 10.29	336 29 42.64	4.3886081	15.204
Brushy Mountain [a]	170 36 59	350 34 56	4.54866	21.979
Tularosa [a]	218 47 07.16	38 58 06.02	4.7289620	33.290
Bearwallow [a]	236 39 44	56 48 38	4.47816	18.686
Grouse [a]	261 26 19	81 33 38	4.32053	12.998

[a] Maricopa datum. [b] U. S. standard datum.

TULAROSA (EAGLE PEAK), SOCORRO COUNTY, N. MEX.

Station is on the highest peak of the Tularosa Mountains, locally known as Eagle Peak, under which name it was occupied by the Wheeler Survey. It is in T. 7 S., R. 17 W., sec. 22, approximate, and is at the head of Long Canyon on the north and Cox Canyon on the south. They both head in a saddle about one-fourth mile west of the station. The Forest Service trail from Tularosa ranger station across mountains to the Nigrito ranger station crosses through the saddle. There is a ranger cabin in saddle from which a trail and telephone line leads east up hill to station. Station is about 11 miles east of Reserve and 15 miles south and 4 miles west of Aragon on the Magdalena public road.

Signal: A pole set over tablet and carrying flags; around the pole was erected a quadripod with white cloth around top, and between this and the flag were placed pine boughs. Three targets of red cloth were placed on the sides of quadripod north, south, and west.

Station mark: A bronze triangulation tablet in a 6 by 8 by 24 inch stone set in ground over which is erected a rock cairn 5 feet high.

[Latitude 33° 40′ 36.94″. Longitude 108° 34′ 36.04″.]

To station —	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Mogollon	2 04 17.05	182 03 42.39	4.6532044	27.961
Bearwallow	18 40 08	198 37 06	4.42536	16.547
Pleasant	38 59 06.02	218 47 07.16	4.7289620	33.290
Sunset	44 43 04.81	224 21 35.98	4.9358163	52.601
Whiterocks	66 09 32.71	245 54 03.26	4.6758515	29.458
Brushy Mountain	80 18 32	260 04 26	4.60118	24.804
Box	120 26 48.54	300 18 50.28	4.4098781	15.967
Escadillo	120 54 03.64	300 35 52.42	4.7685262	36.465
Fox	165 06 30.19	345 02 13.01	4.6630428	28.602
Apache	172 16 04	352 14 35	4.48336	18.911

TURNER PEAK, SOCORRO COUNTY, N. MEX. (Not occupied; sighted from three stations.)

Near the northwest corner of T. 5 S., R. 21 W., about 9 miles northwest of the town of Luna, and about 6 miles southeast of the Forest Service lookout tower on Escadillo Mountain.

Signal and station mark: The highest point of a sharp peak locally known as Turner Peak.

[Latitude 33° 53′ 20.83″. Longitude 109° 02′ 39.36″.]

To station —	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Escadillo	132 12 48	312 10 13	3.98363	5.984
Fox	236 09 59	56 21 22	4.57648	23.434
Whiterocks	359 53 05	179 53 07	4.63140	26.593

WHITEROCKS, SOCORRO COUNTY, N. MEX.

On the highest and most southerly of the three peaks of Whiterocks Mountain, which rises abruptly from the mesa west of the junction of Pueblo Creek with the Rio San Francisco and is about 9 miles northwest of same and 12 miles northwest of Alma. The peak is timbered, but was cleared on the east slope and affords an excellent view for about 90° both sides of due east. Station can be reached by climbing the mountain from almost any direction. Water can be found at the Grey Bull Spring in the next canyon north of the white rocks on the east slope of the third peak north and is about 1½ miles northeast of station. An old rock cairn was found, and on tearing it down to place tablet a tin box was found in which was a paper upon which was written in pencil the following: "Explorations west of the 100th meridian, triangulation station XXX. Occupied Oct. 24th, 1873, Gilbert Thompson, Topographer."

Signal: Flag and targets on oak tree 15 feet high, distance 9 feet, true azimuth 59° 15′ from station mark; tree was braced by a pole quadripod.

Arizona-New Mexico State line crosses the mountain less than 0.25 mile west of station.

[Latitude 33° 30′ 11.79″. Longitude 109° 02′ 36.02″.]

To station —	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Sunset	22 06 12.80	202 00 09.62	4.6585718	28.309
Escadillo	171 40 06.81	351 37 30.81	4.6971698	30.941
Turner Peak	179 53 07	359 53 05	4.63140	26.593
Brushy Mountain	197 38 03	17 39 26	4.11618	8.120
Fox	206 05 49.17	26 17 06.92	4.8514387	44.135
Box	213 07 37.37	33 15 11.08	4.5859557	23.950
Apache	218 16 12	38 30 16	4.79960	39.170
Tularosa	245 54 03.26	66 09 32.71	4.6758515	29.458
Bearwallow	279 35 45	99 48 10	4.54834	21.963
Mogollon	301 28 22.73	121 43 12.63	4.6908202	30.491
Grouse	302 22 41	122 33 29	4.55660	22.385
Pleasant	336 29 42.64	156 33 10.29	4.3886081	15.204

NEW MEXICO.

TRIANGULATION STATIONS.

Koehler, Mount Laughlin, and Ute Creek quadrangles.

COLFAX COUNTY.

In 1914 J. R. Ellis extended triangulation west from stations Eagle-tail and Mount Laughlin, described in Bulletin 551. Eight new stations were occupied and five points were located by intersections; all on approximate North American datum. Azimuth observations were made at Maxwell station; the observed azimuth was used in computations of positions west of the line French-Koehler.

BARTLETT, COLFAX COUNTY, N. MEX.

Situated in northwest part of Colfax County on a small peak about 2 miles northeast of Vermejo Park post office on land owned by Wm. H. Bartlett. The signal is visible from the above post office.

Signal: A small topped pine tree centered over the tablet with a quadripod built around it and covered with white cloth.

Station mark: A bronze tablet cemented in solid rock.

[Latitude 36° 54′ 30.55″. Longitude 104° 57′ 52.20″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Sharp peak to southwest	35 42 46	215 33 53	4.57897	23.568
Sharp peak to west	70 12 22	250 03 05	4.38845	15.198
Ridge	250 44 07	70 47 40	3.96815	5.774
Rock	275 18 37.41	95 21 58.37	3.9201820	5.170
Koehler	303 49 04.02	123 58 32.57	4.4519159	17.590
Colfax	324 03 18	144 12 12	4.57639	23.428
Dawson	348 48 28.90	168 51 17.58	4.3660890	14.436

CHASE, COLFAX COUNTY, N. MEX.

On partly bare knoll at east end of ridge on Mrs. Mary Springer's land and about 3 miles southwest of Chase ranch.

Signal: A pine tree 15 inches in diameter stripped to within 10 feet of top. Signal is 2.4 feet northwest of station mark.

Station mark: A bronze tablet set in solid rock at foot of pine tree.

[Latitude 36° 32′ 22.79″. Longitude 104° 58′ 11.10″.]

To station —	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Knob	18 33 02	198 31 40	4.03112	6.675
Dawson	195 19 46.21	15 21 45.69	4.2742944	11.685
Koehler	223 37 03.12	43 46 40.49	4.5412396	21.607
Colfax	245 16 48	65 25 50	4.39588	15.461
French	279 14 27.53	99 22 44.47	4.3232646	13.080

COLFAX, COLFAX COUNTY, N. MEX. (Not occupied.)

On the south end of a prominent bluff about 3 miles northeast of Maxwell station.

Signal and station mark: A 6-foot rock cairn centered over a bronze tablet set in solid rock.

[Latitude 36° 37′ 59.39″. Longitude 104° 43′ 01.37″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Chase	65 25 50	245 16 48	4.39588	15.461
Dawson	113 49 50	293 42 46	4.28445	11.962
Bartlett	144 12 12	324 03 18	4.57639	23.428
Eagletail	.....	78 47 51	4.44043	17.131
Maxwell	.....	118 31 10	4.32204	13.043

DAWSON, COLFAX COUNTY, N. MEX.

On the southwest end of a wooded ridge on the divide between Von Bremer Creek and Cerososo Arroyo, about 6 miles west and 2 miles north of Dawson village. The ridge is in the shape of a horseshoe and the station stands on the southwest part of ridge.

Signal: A 12-inch pine tree trimmed to within about 10 feet of the top, which stands 2.7 feet southwest of the station mark.

Station mark: A bronze tablet set in sandstone 20 by 20 by 5 inches, which projects 3 inches above surface of ground.

[Latitude 36° 42′ 11.14″. Longitude 104° 54′ 50.80″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Chase	15 21 45.69	195 19 46.21	4.2742944	11.685
Knob	16 32 01	196 28 41	4.47039	18.354
Sharp Peak southwest	73 18 28	253 07 47	4.44434	17.286
Bartlett	168 51 17.58	348 49 28.90	4.3660890	14.436
Rock	189 46 37.68	9 48 09.49	4.3491612	13.884
Koehler	249 43 29.33	69 51 08.01	4.3069900	12.599
Colfax	293 42 46	113 49 50	4.28445	11.962
French	323 44 00.97	143 50 19.43	4.4264875	16.590

EAGLETAIL, COLFAX COUNTY, N. MEX.

Station is situated 16 miles a little south of east from Raton, on the highest point of Eagletail Mountain—a very prominent position. It is on the farther south of the two small peaks on the summit. Considerable timber was cut around this station.

Station mark: An aluminum tablet set in solid rock over which was erected a tripod of poles 12 feet high.

[Latitude 36° 40′ 54.49″. Longitude 104° 24′ 52.66″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Goat Hill	173 50 12	.....	4.39522	15.437
Yankee	196 42 52.72	16 45 58.20	4.4257508	16.562
Bellisle	216 19 28.73	36 27 35.26	4.5305900	21.083
Thomson	238 58 36.16	59 07 05.77	4.3917615	15.315
Laughlin	286 54 22.69	107 02 35.48	4.3311658	13.320
Maxwell	29 12 53.99	209 09 27.53	4.2465241	10.962
French	56 32 43.57	236 21 09.96	4.5403411	21.562
Colfax	78 47 51	.....	4.44043	17.131
Koehler	110 11 33.24	290 01 16.67	4.4355593	16.931
Red River	150 43 39.38	330 40 33.26	4.1978934	9.800
Highest peak of group	340 19 32	160 21 33	4.17414	9.279

FRENCH, COLFAX COUNTY, N. MEX.

On the east point of a flat-topped butte, the northernmost of a group of three, on land owned by Capt. French, and is about 7 miles due south of Colfax station.

Signal: A small (topped) piñon tree centered over tablet and supported by four poles. White cloth was tacked to the four faces.

Station mark: A bronze tablet in top of sandstone 5 by 12 by 26 inches, which projects 5 inches above surface of ground 15 feet east of point of butte.

[Latitude 36° 30′ 32.30″. Longitude 104° 44′ 16.13″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Knob	74 25 48	254 16 10	4.40025	15.618
Chase	99 22 44.47	279 14 27.53	4.3232646	13.080
Dawson	143 50 19.43	323 44 00.97	4.4264875	16.590
Koehler	186 33 31.83	6 34 50.80	4.4584027	17.855
Koehler, observed azimuth	186 33 10.62	6 34 29.52		
Red River	212 39 44.73	32 48 13.61	4.5927348	24.327
Eagletail	236 21 09.96	56 32 43.57	4.5403411	21.562
Maxwell	259 24 32.14	79 32 38.58	4.3155726	12.851

HIGHEST PEAK IN GROUP EAST OF MAXWELL, COLFAX COUNTY, N. MEX. (Not occupied.)

The highest point of the highest peak of a group of peaks situated about 9 miles due east of Maxwell City.

Station mark: A rock or small tree on the highest part of peak.

[Latitude 36° 33′ 18.28″. Longitude 104° 21′ 30.50″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Maxwell	84 26 20	264 20 54	4.13682	8.514
Eagletail	160 21 33	340 19 32	4.17414	9.279
Laughlin	243 13 07	63 19 16	4.23930	10.780

KNOB, COLFAX COUNTY, N. MEX. (Not occupied.)

Station mark: A large sharp-topped rock projecting from a spur of the Snow Range Mquntains.

[Latitude 36° 26′ 52.34″. Longitude 105° 00′ 28.33″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Dawson	196 28 41	16 32 01	4.47039	18.354
Chase	198 31 40	18 33 02	4.03112	6.675
French	254 16 10	74 25 48	4.40025	15.618

KOEHLER, COLFAX COUNTY, N. MEX.

About 6 miles northwest of Koehler village, at the highest point of the intersection of three ridges, which forms a T with the stem pointing north. The hill is timbered, but lines were opened from the station to the surrounding stations.

Signal: A 40-foot pole carrying cross arms to which black cloth targets were attached. The pole is wired and nailed to a stripped tree. Signal is 9.5 feet northwest of station mark.

Station mark: A bronze tablet set in top of sandstone 26 by 10 by 5 inches projecting 4 inches above surface of ground.

[Latitude 36° 45′ 58.38″. Longitude 104° 42′ 03.91″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
French	6 34 50.80	186 33 31.83	4.4584027	17.855
French, observed azimuth	6 34 29.52	186 33 10.62	.....	.....
Chase	43 46 40.49	223 37 03.12	4.5412396	21.607
Dawson	69 51 08.01	249 43 29.23	4.3069900	12.599
Bartlett	123 58 32.57	303 49 04.02	4.4519159	17.590
Rock	134 41 12.16	314 35 04.29	4.3297740	13.278
Red River	256 07 58.91	76 15 10.08	4.2644453	11.423
Eagletail	290 01 16.67	110 11 33.24	4.4353393	16.931

LAUGHLIN, COLFAX COUNTY, N. MEX.

A bare, grassy mountain about 18 miles east of Maxwell, at the head of Tinaja Creek, in T. 28 N., R. 26 E. The station is on highest point of the mountain and about 2 miles east of Gus Brackett's ranch. This mountain is known by some as Laughlins Peak, but by more as Old Baldy.

Station mark: An aluminum tablet in loose stone 1 foot underground, over which is a stone with drill hone 4 inches underground. A pile of stone above ground marks the site.

[Latitude 36° 37′ 31.45″. Longitude 104° 11′ 07.18″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Eagletail	107 02 35.48	286 54 22.69	4.3311658	13.320
Goat Hill	143 18 08	.....	4.58717	24.017
Yankee	158 07 03.13	338 01 54.36	4.5347908	21.288
Thomson	181 59 03.02	1 59 18.84	4.2775297	11.773
Highest peak of group	63 19 16	243 13 07	4.23930	10.780
Maxwell	72 40 13.99	252 28 35.68	4.4877057	18.970
Red River Peak	125 26 59.46	305 15 39.95	4.5389034	21.491

MAXWELL, COLFAX COUNTY, N. MEX.

On the highest part of a low hill 1.5 miles due east of the town of Maxwell. The Maxwell-Chico wagon road runs south of the station, about 0.25 mile distant. Azimuth observations were made on Polaris October 13, 1914.

Signal: A 12-foot sawed lumber tripod covered with white cloth on the upper portion of the 3 sides. Centered over station mark.

Station mark: A bronze tablet set in the top of a concrete post 7 by 9 by 40 inches, which projects 6 inches above surface of ground.

[Latitude 36° 32′ 34.84″. Longitude 104° 30′ 38.83″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
French	79 32 38.58	259 24 32.14	4.3155726	12.851
Colfax	118 31 10	... .	4.32204	13.043
Red River	181 42 26.83	1 42 47.77	4.4649220	18.125
Eagletail	209 09 27.53	29 12 53.99	4.2465241	10.962
Laughlin	252 28 35.68	72 40 13.99	4.4847057	18.979
Highest peak of group	264 20 54	84 26 20	4.13682	8.514

RED RIVER PEAK, COLFAX COUNTY, N. MEX. (Not occupied.)

Station is on peak about 10 miles southwest of Raton and 3 miles southwest of Otero, on the Atchison, Topeka & Santa Fe Railway.

Station mark: An aluminum tablet set in stone placed in ground, over which was erected a tripod of poles 6 feet high.

[Latitude 36° 48′ 20.71″. Longitude 104° 30′ 03.77″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Barela	.....	43 00 16	4.50719	19.977
Yankee	.....	52 37 20	4.28701	12.033
Thomson	.....	92 14 25	4.46019	17.928
Maxwell	1 42 47.77	181 42 26.83	4.4649220	18.125
French	32 48 13.61	212 39 44.73	4.5927348	24.327
Koehler	76 15 10.08	256 07 58.91	4.2644453	11.423
Laughlin	305 15 39.95	125 26 59.46	4.5389034	21.491
Eagletail	330 40 33.26	150 43 39.38	4.1978934	9.800

RIDGE, COLFAX COUNTY, N. MEX. (Not occupied; sighted from two stations only; no check on this position.)

[Latitude 36° 56′ 09.86″. Longitude 104° 51′ 57.70″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Rock	7 17 47	187 17 35	3.58737	2.403
Bartlett	70 47 40	250 44 07	3.96815	5.774

ROCK, COLFAX COUNTY, N. MEX.

On the highest part of ridge, about 8 miles east of Vermejo Park post office. It is near the divide between Red River and Rio Vermejo. Road Canyon heads about 3 miles north of the station. A wagon road leaves the Rio Vermejo valley about 3 miles southeast of Vermejo Park post office and follows up Road Canyon and over the divide to Bartlett's horse ranch, thence down Longs Canyon.

Signal: A 12-foot tripod covered with white cloth, centered over tablet.

Station mark: A bronze tablet cemented in solid rock on small knoll at highest point of ridge.

[Latitude 36° 54′ 05.44″. Longitude 104° 52′ 17.54″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Dawson	9 48 09.49	189 46 37.68	4.3491612	13.884
Sharp peak to southwest	45 26 05	225 13 49	4.63020	26.519
Sharp peak to west	76 33 31	2o6 20 53	4.50771	20.001
Bartlett	95 21 58.37	275 18 37.41	3.9201820	5.170
Ridge	187 17 35	7 17 47	3.58737	2.403
Koehler	314 35 04.29	134 41 12.16	4.3297740	13.278

SHARP PEAK TO SOUTHWEST, COLFAX COUNTY, N. MEX. (Not occupied.)

A sharp peak in the Snow Range, about 22 miles west of Dawson village. From French and Maxwell triangulation stations a cairn was visible, and was sighted.

Station mark: A cairn.

[Latitude 36° 37′ 50.57″. Longitude 105° 12′ 43.31″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Bartlett	215 33 53	35 42 46	4.57897	23.568
Rock	225 13 49	45 26 05	4.63020	26.519
Dawson	253 07 47	73 18 28	4.44434	17.286

SHARP PEAK TO WEST, COLFAX COUNTY, N. MEX. (Not occupied; sighted from only two stations; no check on this position.)

A high summit in the Snow Range, probably Castilla Peak.
Station mark: A cairn.

[Latitude 36° 50′ 00.84″. Longitude 105° 13′ 20.96″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Bartlett	250 03 05	70 12 22	4.38845	15.198
Rock	256 20 53	76 33 31	4.50771	20.001

CALIFORNIA.

TRIANGULATION STATIONS.

Argus Peak, Bagdad, Berry, Elizabeth Lake, Freeman, Hinkley, Kramer, Johannesburg, Pilot Knob, 17, Tecopa, and Telescope Peak 30′ quadrangles.

INYO, KERN, LOS ANGELES, AND SAN BERNARDINO COUNTIES.

During the seasons of 1911, 1912, and 1913 Messrs. C. F. Urquhart, W. R. Chenoweth, and Charles Hartman extended triangulation over the above-named quadrangles.

Positions are on approximate North American datum as derived from United States Geological Survey stations Odell and Soledad, described in Bulletin 201. Connections were also made with stations El Paso, Grey, Kelso, Kingston, Oro Grande, Owens Peak, and Telescope, previously located and described in Bulletin 310. Sixteen stations were occupied and 14 points were located by intersections.

ARGUS, SAN BERNARDINO COUNTY, CAL.

An exceptionally rocky mountain, 10 miles northeast of "Borax Flat" headquarters. It can be reached on horseback from "Borax Flat" by going to Joe Peterson's ranch (7 miles), thence by trail which starts on south side of ranch to summit of mountains.

Station mark: A large bowlder, 18 feet high, with a bronze triangulation tablet set in top.

[Latitude 35° 51′ 09.20″. Longitude 117° 26′ 45.23″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Red	12	36	54.14	192	32	05.90	4.7577497	35.571
El Paso	40	42	11.52	220	28	20.43	4.7412037	34.242
Owens	75	54	15.61	255	34	56.51	4.7104814	31.903
Volcano	108	26	39.58	288	13	06.72	4.5636742	22.752
Telescope	222	19	44.31	42	32	20.67	4.6789270	29.667
Needle	264	08	54.17	84	23	35.73	4.5790223	23.571
Brown	295	11	26.86	115	26	31.71	4.6336203	26.728
Pilot	338	22	17.12	158	29	58.87	4.7345946	33.725

AVAWATZ, SAN BERNARDINO COUNTY, CAL. (Not occupied.)

Signal was built and marked, but was not occupied, and there is no available description.

[Latitude 35° 30′ 46.83″. Longitude 116° 19′ 51.10″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Tie Fort	38	43	50.36	218	36	01.83	4.5141646	20.301
Calico	38	56	38.19	218	39	04.75	4.8670768	45.754
Pilot	81	18	13.04	260	47	04.40	4.9150675	51.100
Brown	107	27	07.20	287	03	11.61	4.8129266	40.390
Kingston	237	39	34.78	57	54	06.89	4.6487748	27.677
Kelso	309	11	00.35	129	32	03.02	4.8535638	44.352
Cave	359	08	32.33	179	08	49.07	4.6904511	30.465

BALD, KERN COUNTY, CAL.

A bald granite mountain about 15 miles north of Mojave and 4.5 miles southwest of Cinco. It is easily ascended on horseback from Cinco by keeping along the base of foothills and following up a ridge on the north side of a prominent canyon 1,200 feet wide and 2 miles south of Cinco.

Station mark: A 7-foot rock cairn over a bronze triangulation tablet.

[Latitude 35° 16′ 21.92″. Longitude 118° 05′ 40.54″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Soledad	14	53	09.44	194	49	55.45	4.5222702	20.683
Owens	189	45	14.16	9	48	39.52	4.7197137	32.588
El Paso	225	32	30.00	45	41	16.72	4.5070022	19.969
Red	259	32	41.17	79	50	24.81	4.6743912	29.359
Rich	313	36	32.25	133	50	52.26	4.7193548	32.561
Desert	325	30	45.90	145	36	09.73	4.4004706	15.625

BROWN, SAN BERNARDINO COUNTY, CAL.

A prominent double-topped mountain in southern part of the Panamint Range and just south of Wingate Pass. It is about 6 miles due east across the valley from Lone Willow Spring, which is situated on the Ballarat and Granite Wells Spring. The mountain can be easily climbed from any direction. The signal is on the eastern-most part of mountain.

Station mark: A cairn 9 feet high and 7 feet at base.

Reference mark: A bronze triangulation tablet cemented in a prominent rock about 3.5 feet west of signal.

[Latitude 35° 41′ 12.37″. Longitude 117° 00′ 57.22″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Opal	20	57	06.80	200	50	44.75	4.6674440	28.893
Pilot	30	43	49.48	210	36	30.44	4.5716914	23.176
Red	54	06	37.58	233	46	50.60	4.8040016	39.569
El Paso	72	50	43.12	252	21	52.98	4.8946108	48.749
Argus	115	26	31.71	295	11	26.86	4.6336203	26.728
Telescope	173	03	02.48	353	00	29.00	4.7326507	33.574
Needle	177	11	03.35	357	10	37.92	4.3465047	13.799
Kingston	267	06	37.30	87	45	10.63	4.9988570	61.974
Avawatz	287	03	11.61	107	27	07.20	4.8129266	40.390
Tie Fort	316	51	34.36	137	07	36.39	4.7870874	38.057
Calico	348	01	29.73	168	07	40.57	4.8940800	48.689

CALICO, SAN BERNARDINO COUNTY, CAL.

Highest point upon what is known as the Calico Mountains, lying about 7 miles a little west of north of the town of Otis, on the San Pedro, Los Angeles & Salt Lake Railroad, and about 10 miles north of the town of Daggett. Animals can be ridden nearly to summit of mountain from the south by following the trail up first main canyon east of the site of the old town of Calico.

Signal and station mark: A cairn 7 feet high and 8 feet at base.

Reference mark: A bronze triangulation tablet cemented in rock 11 feet north of signal.

[Latitude 34° 59′ 44.63″. Longitude 116° 50′ 16.14″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Sharp	38	27	04.91	218	17	17.36	4.6241388	26.151
General	80	13	32.84	260	03	31.63	4.4314649	16.781
Rich	86	09	16.38	265	40	20.21	4.8866935	47.868
Red	120	11	45.91	299	45	59.68	4.8944157	48.727
Pilot	141	43	20.19	321	29	55.35	4.7549816	35.345
Brown	168	07	40.57	348	01	29.73	4.8940800	48.689
Avawatz	218	39	04.75	38	56	38.19	4.8670768	45.754
Tie Fort	218	49	17.15	38	59	02.03	4.6123915	25.453
Kingston	225	41	11.35	46	13	14.23	5.0670688	72.514
Cave	259	45	36.32	80	03	20.63	4.6788306	29.661
Kelso	262	52	40.58	83	31	03.33	5.0100266	63.588
Tit	333	48	19.49	153	55	30.92	4.6394214	27.088

CAVE, SAN BERNARDINO COUNTY, CAL.

No description furnished.

Station mark: A triangulation tablet under a rock monument.

[Latitude 35° 04′ 16.07″. Longitude 116° 19′ 22.13″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Tit	30	31	05.40	210	20	37.60	4.7410748	34.231
Calico	80	03	20.63	259	45	36.32	4.6788306	29.661
Pilot	114	02	35.71	293	31	20.47	4.9533513	55.809
Tie Fort	138	01	40.95	317	53	38.26	4.5005084	19.672
Avawatz	179	08	49.07	359	08	32.33	4.6904511	30.465
Kingston	206	52	03.67	27	06	14.31	4.9120250	50.743
Kelso	265	53	32.01	86	14	11.13	4.7382534	34.010
Old Dad [a]	298	00	42.61	118	22	17.58	4.8137179	40.464

[a] Not adjusted.

DESERT, KERN COUNTY, CAL.

A small bald hill about 14 miles east of Mojave, a town at the junction of the Southern Pacific & Santa Fe railroads.

Signal and station mark: A cairn about 6 feet high over a triangulation tablet.

[Latitude 35° 05′ 08.98″. Longitude 117° 56′ 18.47″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Soledad	63	25	40.99	243	17	04.79	4.4065554	15.845
Bald	145	36	09.73	325	30	45.90	4.4004706	15.625
Red	227	48	44.91	48	01	01.96	4.6390395	27.064
Fremont	254	35	15.21	74	51	59.12	4.6605822	28.440
Rich	303	07	46.39	123	16	41.88	4.4514375	17.571
Muroc	342	47	50.82	162	49	56.96	4.2757725	11.725

EL PASO, KERN COUNTY, CAL.

This point is a Wheeler Survey station, on the highest point of range of mountains, about 12 miles northwest of Johannesburg, and can be reached on horseback.

Station mark: A cairn 7 feet high over a bronze triangulation tablet.

[Urquhart, 1913: Latitude 35° 28′ 31.33″; longitude 117° 50′ 30.70″. Goode, 1900: Latitude 35° 28′ 32.61″; longitude 117° 50′ 33.28″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Soledad	30	05	02.10	209	53	02.77	4.8000085	39.207
Bald	45	41	16.72	225	32	30.00	4.5070022	19.969
Owens	154	25	54.70	334	20	30.84	4.5103725	20.124
Volcano	181	03	32.17	1	03	55.15	4.7273318	33.165
Argus	220	28	20.43	40	42	11.52	4.7412037	34.242
Needle	237	59	22.60	58	27	51.60	4.9378501	53.852
Brown	252	21	52.98	72	50	43.12	4.8946108	48.749
Pilot	278	35	11.78	98	56	37.89	4.7528974	35.176
Red	300	46	59.26	120	55	58.34	4.4368487	16.990
Fremont	311	21	04.41	131	34	32.01	4.6726467	29.241
Rich	345	47	32.32	165	53	20.88	4.7820496	37.618
Laurel[a]	267	47	38.86	87	53	09.80	4.1579419	.....
Government[a]	311	39	38.03	131	45	30.87	4.3134470	.....

[a] Goode, 1900.

FREMONT PEAK, SAN BERNARDINO COUNTY, CAL. (Not occupied.)

The highest point of a mountain well known as Fremont Peak. It is about 12 miles southeast of Johannesburg.

[Latitude 35° 11′ 40.23″. Longitude 117° 27′ 14.31″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Rich	36	47	16.93	216	39	30.98	4.5360744	21.351
Soledad	70	52	41.10	250	27	21.56	4.8510179	44.093
Desert	74	51	59.12	254	35	15.21	4.6605822	28.440
El Paso	131	34	32.01	311	21	04.41	4.6726467	29.241
Red	145	31	52.10	325	27	22.97	4.3179348	12.921
Pilot	222	35	39.57	42	43	34.41	4.4863110	19.040
General	311	54	35.89	132	05	47.77	4.6005743	24.770

GENERAL, SAN BERNARDINO COUNTY, CAL.

On highest point of a prominent mountain about 3 miles east of Hinkley, a station on the Atchison, Topeka & Santa Fe Railway.

Signal and station mark: A cairn 8 feet high.

Reference mark: A bronze triangulation tablet, set 3 feet northwest of cairn.

[Latitude 34° 57′ 14.60″. Longitude 117° 07′ 45.09″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Oro Grande	20	57	14.19	200	51	47.82	4.6102313	25.327
Iron	42	58	57.97	222	55	23.93	4.1441013	8.659
Rich	89	10	10.61	268	51	16.25	4.7011500	31.225
Fremont	132	05	47.77	311	54	35.89	4.6005743	24.770
Red	136	45	25.15	316	29	43.64	4.7801131	37.451
Calico	260	03	31.63	80	13	32.84	4.4314649	16.781
Sharp	358	56	19.91	178	56	31.68	4.4529785	17.633

GREY BUTTE, LOS ANGELES COUNTY, CAL.

A small butte in the Mojave Desert, northeast of mouth of canyon, and 25 miles west of Hesperia. Station can be reached by driving from Hesperia to "Aleck the Frenchman's," distance about 25 miles, which is a ranch at the head of Wescal Canyon, where one can get hay and water. The point is about 12 miles northwest of this ranch and in plain sight. Take road leading to Rock Creek until it joins main Hesperia road, thence directly across desert to Butte (do not take Canaigne-Diggets

road). There are several ranches to the southwest of the Rock Creek settlement which appear much nearer than "Aleck the Frenchman's." The road leading to Aleck's from the Hesperia road is marked by large granite rock with several small ones placed on it.

Station mark: Aluminum tablet set in gravel and cement

Signal: Rock cairn 6 feet high over station mark.

[Latitude 34° 33′ 25.02″. Longitude 117° 43′ 20.79″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
West Baldy [a]	9	51	13.32	189	49	48.74	4.3487810	.....
Little Rock [a]	42	47	58.40	222	41	39.14	4.4012929	.....
Morley [a]	52	57	08.28	232	53	18.33	4.1130401	.....
Pacifico [a]	56	00	55.62	235	50	20.82	4.5385670	.....
Almondale Schoolhouse [a]	73	19	22.25	253	12	37.00	4.2796344	.....
Emma	73	36	53.76	253	25	42.11	4.4987313	.....
Palmer [a]	81	27	45.96	261	20	37.31	4.2899405	.....
Odell	88	20	09.80	268	02	44.87	4.6720994	29.205
Soledad	138	03	29.17	317	47	32.86	4.8036980	39.541
Rich	185	13	19.06	5	14	47.72	4.6371514	26.946
Oro Grande	261	20	52.85	81	35	40.36	4.6052554	25.038
Oro Grande [a]	261	20	14.92	81	35	02.26	4.6052096	.....
Cleghorn [a]	315	29	31.03	135	40	03.19	4.6106263	.....
San Antonio [a]	346	36	53.48	166	39	29.57	4.4843982	.....

[a] Yolo datum.

IRON, SAN BERNARDINO COUNTY, CAL. (Not occupied.)

A prominent low mountain covered with black rock about 5 miles south of Hinkley, a station on the Santa Fe Railroad.

Station mark and signal: A cairn 7 feet high over a bronze triangulation tablet.

[Latitude 34° 51′ 43.63″. Longitude 117° 13′ 59.11″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Oro Grande	10	15	45.76	190	13	52.89	4.4522241	17.602
Red	149	29	58.77	329	17	53.43	4.7976055	38.990
General	222	55	23.93	42	58	57.97	4.1441013	8.659

KELSO, SAN BERNARDINO COUNTY, CAL.

On highest point of low range of mountains about 8 miles northeast of Kelso, a small town on the San Pedro, Los Angeles & Salt Lake R. R. There is no road to the station.

Signal and station mark: Cairn 6 feet high.

Reference mark: Triangulation tablet 1.3 meters north of signal.

[Urquhart, 1913: Latitude 35° 06′ 17.97″; longitude 115° 43′ 26.51″. Urquhart, 1909: Latitude 35° 06′ 16.57″; longitude 115° 43′ 27.83″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Calico	83	31	03.33	262	52	40.58	5.0100266	63.588
Cave	86	14	11.13	265	53	32.01	4.7382534	34.010
Tie Fort	104	51	39.54	284	22	54.25	4.8935640	48.631
Avawatz	129	32	03.02	309	11	00.35	4.8535638	44.352
Kingston	165	57	14.88	345	50	36.66	4.8522307	44.216
Kingston [a]	165	57	05.76	345	50	27.38	4.8523483	.....
Rocky [a]	170	48	25.96	350	47	01.12	4.3667854	.....
Clark [a]	194	47	57.35	14	52	40.49	4.6840579	.....
McCullough [a]	221	42	12.68	42	01	07.95	4.8705980	.....
New York [a]	245	10	16.30	65	24	31.15	4.6161919	.....
Old Dad [b]	355	32	27.97	175	33	28.63	4.5394017	21.516

[a] Urquhart, 1909.

[b] Not adjusted.

KINGSTON,[1] SAN BERNARDINO COUNTY, CAL. (Not occupied.)

On the highest point of Kingston Range. It is about 20 miles west-southwest of Sandy post office. The nearest known water is at Horse Spring, on northeast side of mountain.

Signal: A rock cairn 6 feet high with tree in center.

Station mark: A triangulation tablet under center of cairn.

[Latitude 35° 43′ 36.58″ (Urquhart, 1909). Longitude 115° 54′ 55.30″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Nopah	154	23	33.23	334	17	45.05	4.5369904	.....
Olcott	234	34	49.68	54	49	23.12	4.6614279	.....
Ivanpah	274	18	06.35	94	34	17.15	4.6225419	.....
McCollough	281	26	27.24	101	52	12.00	4.8327703	.....
Clark	306	54	53.01	127	06	18.76	4.5693575	.....
New York	313	13	46.85	133	34	47.43	4.8769283	.....
Kelso	345	50	27.38	165	57	05.76	4.8523483	44.228
Rocky	343	29	26.85	163	34	40.75	4.6815389	.....

KINGSTON, SAN BERNARDINO COUNTY, CAL. (Not occupied.)

On the highest point of Kingston Range. It is about 20 miles west-southwest of Sandy post office. The nearest known water is at Horse Spring, on northeast side of mountain.

Signal: A rock cairn 6 feet high with tree in center.

Station mark: A triangulation tablet under center of cairn.

[Latitude 35° 43′ 37.40″ (Urquhart, 1913). Longitude 115° 54′ 53.67″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Cave	27	06	14.31	206	52	03.67	4.9120250	50.743
Calico	46	13	14.23	225	41	11.35	5.0670688	72.514
Tie Fort	49	54	19.71	229	32	00.26	4 8818844	47.341
Avawatz	57	54	06.89	237	39	34.78	4.6487748	27.677
Brown	87	45	10.63	267	06	37.30	4.9988570	61.974
Kelso	345	50	36.66	165	57	14.88	4.8522307	44.216

KINGSTON, SAN BERNARDINO COUNTY, CAL. (Not occupied.)

On the highest point of Kingston Range. It is about 20 miles west-southwest of Sandy post office. The nearest known water is at Horse Spring, on northeast side of mountain.

Signal: A rock cairn 6 feet high with tree in center.

Station mark: A triangulation tablet under center of cairn.

[Latitude 35° 43′ 36.40″ (Blackburn, 1907; Moor, 1907). Longitude 115° 54′ 55.04″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Furnace	139	50	31	319	25	55	4.98632	.....
Nopah	154	24	04	334	18	10	4.53715	.....
Charleston	198	06	52	18	14	39	4.80381	.....
Olcott	234	34	34	54	49	00	4.66141	.....

[1] See p. 37.

MUROC, KERN COUNTY, CAL. (Not occupied.)

Station mark: Center of water tank at Muroc station on Santa Fe Railway, between Mojave and Barstow.

[Latitude 34° 55′ 23.98″. Longitude 117° 52′ 38.60″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Soledad	103	09	32.71	282	58	51.58	4.4646310	18.113
Desert	162	49	56.96	342	47	50.82	4.2757725	11.725
Red	209	29	02.32	29	39	11.35	4.7347212	33.734
Rich	261	56	57.78	82	03	46.27	4.2620078	11.359

NEEDLE, INYO COUNTY, CAL. (Not occupied.)

The highest point on a prominent peak which was not occupied.

[Latitude 35° 53′ 12.07″. Longitude 117° 01′ 40.72″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Pilot	18	19	17.11	198	12	22.34	4.7569460	35.506
El Paso	58	27	51.60	237	59	22.60	4.9378501	53.852
Argus	84	23	35.73	264	08	54.17	4.5790223	23.571
Brown	357	10	37.92	177	11	03.35	4.3465047	13.799

ODELL, LOS ANGELES COUNTY, CAL.

On the western end of a long flat ridge, 6 miles north-northwest of Acton and 0.2 mile north-northwest of Mr. Odell's house. The ridge is nearly free from brush and can be easily ascended on horseback.

Station mark: A copper bolt sunk in the solid outcropping ledge, above which a cairn 8 feet high and 8 feet in diameter was erected.

[Latitude 34° 32′ 36.87″. Longitude 118° 14′ 03.28″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Fernando	40	12	54.37	220	06	17.92	4.4431714	.....
Frazier	111	07	16.02	290	42	12.40	4.8577810	.....
Liebre	116	22	54.38	296	11	14.73	4.5440811	.....
Soledad	184	55	39.21	4	57	13.63	4.6893126	30.385
Rich	228	31	47.11	48	50	45.84	4.8303542	42.044
Grey	268	02	44.87	88	20	09.80	4.6720994	29.205
San Gabriel	339	20	32.83	159	25	09.77	4.5510244	.....
Gleason	344	10	08.58	164	12	05.70	4.2843385	.....

OLD DAD, SAN BERNARDINO COUNTY, CAL. (Not occupied.)

No description furnished.

[Latitude 34° 47′ 37.71″. Longitude 115° 41′ 40.62″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Tit	79	11	33.64	258	39	39.98	4.9401265	54.135
Cave	118	22	17.58	298	00	42.61	4.8137179	40.464
Kelso	175	33	28.63	355	32	27.97	4.5394017	21.516

OPAL, SAN BERNARDINO COUNTY, CAL. (Not occupied.)

A prominent mountain not very high, about 7 miles south-southeast of Pilot Knob.
Station mark: A small cairn on highest point.

[Latitude 35° 17′ 42.84″. Longitude 117° 11′ 55.29″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Red	99	46	48.64	279	33	27.82	4.5501007	22.052
Pilot	167	48	46.19	347	47	49.95	4.0652366	7.221
Brown	200	50	44.75	20	57	06.80	4.6674440	28.893

ORO GRANDE, SAN BERNARDINO COUNTY, CAL.

A rocky mountain, 6 miles northwest of Victorville, a station on the Santa Fe Railway. The summit can be reached on horseback, but it is very rough.
Station mark: A copper triangulation bolt under a cairn 9 feet high.

[Latitude 34° 36′ 38.97″. Longitude 117° 17′ 17.20″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Cleghorn [a]	17	57	42.60	197	53	30.81	4.5671803	.....
San Antonio [a]	42	45	28.44	222	33	20.31	4.6856852	.....
Lone Pine [a]	44	51	30.96	224	39	26.64	4.6665360	.....
Grey Butte [a]	81	35	02.26	261	20	14.92	4.6052096	.....
Grey Butte	81	35	40.36	261	20	52.85	4.6052554	25.038
Rich	136	12	57.05	315	59	33.89	4.7129535	32.085
Red	161	51	24.21	341	41	14.69	4.9355717	53.570
Ivan	190	13	52.89	10	15	45.76	4.4522241	17.602
General	200	51	47.82	20	57	14.19	4.6102313	25.327
Sharp	237	13	11.93	57	18	48.99	4.2539194	11.150
Antelope [a]	301	56	01.30	122	03	07.61	4.3539870	.....
San Gorgonio [a]	322	54	57.27	143	10	39.59	4.8511948	.....

[a] Yolo datum.

OWENS, KERN COUNTY, CAL. (Not occupied.)

A high peak, 20 miles east of Kernville, on the waters of the South Fork of Kern River.
Station mark: A cairn, probably erected by the Wheeler Survey.

[Urquhart, 1913: Latitude 35° 44′ 18.94″; longitude 117° 59′ 46.95″. Perkins, 1901: Latitude 35° 44′ 18.60″; longitude 117° 59′ 46.99″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Bald	9	48	39.52	189	45	14.16	4.7197137	32.588
Pah Ute [a]	48	24	22.08	228	10	35.43	4.6802818	.....
Sunday [a]	95	25	22.55	275	04	45.81	4.7274706	.....
Big Meadows [a]	124	18	30.89	304	06	42.62	4.5649336	.....
Volcano	211	41	37.65	31	47	26.46	4.4534702	17.653
Argus	255	34	56.51	75	54	15.61	4.7104814	31.903
El Paso	334	20	30.84	154	25	54.70	4.5103725	20.124

[a] Perkins, 1901.

PILOT, SAN BERNARDINO COUNTY, CAL.

A Wheeler Survey station, about 25 miles east of Johannesburg and 2 miles east of Granite Springs. Can be ascended on horseback from the south side.

Signal and station mark: A cairn 9 feet high.

Reference mark: A bronze triangulation tablet 2 feet southwest of cairn.

[Latitude 35° 23′ 51.41″. Longitude 117° 13′ 32.50″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Rich	39	39	24.34	219	23	43.82	4.8123792	40.339
Fremont	42	43	34.41	222	35	39.57	4.4863110	19.040
Soledad	62	34	41.94	242	01	24.95	4.9956979	61.525
Red	80	40	34.07	260	28	08.52	4.5179146	20.477
El Paso	98	56	37.89	278	35	11.78	4.7528974	35.176
Volcano	138	42	12.91	318	21	02.16	4.9176920	51.409
Argus	158	29	58.87	338	22	17.12	4.7345946	33.725
Telescope	188	11	27.37	8	16	16.06	4.9375483	53.814
Needle	198	12	22.34	18	19	17.11	4.7569460	35.506
Brown	210	36	30.44	30	43	49.48	4.5716914	23.176
Avawatz	260	47	04.40	81	18	13.04	4.9150675	51.100
Tie Fort	281	35	16.24	101	58	31.73	4.7940311	38.671
Cave	293	31	20.47	114	02	35.71	4.9533513	55.809
Calico	321	29	55.35	141	43	20.19	4.7549816	35.345
Tit	326	44	18.41	147	04	53.36	4.9996874	62.092
Opal	347	47	49.95	167	48	46.19	4.0652366	7.221
Sharp	353	06	52.24	173	10	23.61	4.8928770	48.554

RED, SAN BERNARDINO COUNTY, CAL.

The highest point on a prominent mountain about 3 miles southeast of Johannesburg. It can be reached on horseback.

Signal and station mark: An 8-foot rock cairn.

Reference mark: Bronze tablet set 2 feet southwest of cairn.

[Latitude 35° 20′ 56.26″. Longitude 117° 35′ 00.38″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Rich	11	05	00.57	191	01	42.03	4.6582249	28.286
Muroc	29	39	11.35	209	29	02.32	4.7347212	33.734
Desert	48	01	01.96	227	48	44.91	4.6390395	27.064
Soledad	53	46	19.02	233	25	25.01	4.8354356	42.539
Bald	79	50	24.81	259	32	41.17	4.6743912	29.359
El Paso	120	55	58.34	300	46	59.26	4.4368487	16.990
Volcano	161	40	33.58	341	31	54.26	4.8513739	44.129
Argus	192	32	05.90	12	36	54.14	4.7577497	35.571
Telescope	206	01	01.74	26	18	22.89	5.0065117	63.076
Brown	233	46	50.60	54	06	37.58	4.8040016	39.569
Pilot	260	28	08.52	80	40	34.07	4.5179146	20.477
Opal	279	33	27.82	99	46	48.64	4.5501007	22.052
Calico	299	45	59.68	120	11	45.91	4.8944157	48.727
General	316	29	43.64	136	45	25.15	4.7801131	37.451
Fremont	325	27	22.97	145	31	52.10	4.3179348	12.921
Iron	329	17	53.43	149	29	58.77	4.7976055	38.990
Oro Grande	341	41	14.69	161	51	24.21	4.9355717	53.570

RICH, KERN COUNTY, CAL.

On the highest point of ridge about 4 miles south of Rich station on Santa Fe Railway. It can be easily reached on horseback.

Signal and station mark: A cairn 7 feet high.

Reference mark: A bronze bolt set in rock, 3 feet northeast of cairn.

[Latitude 34° 56′ 46.48″. Longitude 117° 40′ 45.25″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Grey	5	14	47.72	185	13	19.06	4.6371514	26.946
Odell	48	50	45.84	228	31	47.11	4.8303542	42.044
Muroc	82	03	46.27	261	56	57.78	4.2620078	11.359
Soledad	95	07	27.73	274	49	57.62	4.6689780	28.995
Desert	123	16	41.88	303	07	46.39	4.4514375	17 571
Bald	133	50	52.26	313	36	32.25	4.7193548	32.561
El Paso	165	53	20.88	345	47	43.32	4.7820496	37.618
Red	191	01	42.03	11	05	00.57	4.6582249	28.286
Fremont	216	39	30.98	36	47	16.93	4.5360744	21.351
Pilot	219	23	43.82	39	39	24.34	4.8123792	40.339
Calico	265	40	20.21	86	09	16.38	4.8866935	47.868
General	268	51	16.25	89	10	10.61	4.7011500	31.225
Sharp	298	15	10.97	118	34	13.50	4.7620027	35.921
Oro Grande	315	59	33.89	136	12	57.05	4.7129535	32.085

SHARP, SAN BERNARDINO COUNTY, CAL. (Not occupied.)

A very prominent cone-shaped peak on east side of Mojave River about 15 miles south-southwest of Barstow.

[Latitude 34° 41′ 53.84″. Longitude 117° 07′ 24.43″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Oro Grande	57	18	48.99	237	13	11.93	4.2539194	11.150
Rich	118	34	13.50	298	15	10.97	4.7620027	35.921
Pilot	173	10	23.61	353	06	52.24	4.8928770	48.554
General	178	56	31.68	358	56	19.91	4.4529785	17.633
Calico	218	17	17.36	38	27	04.91	4.6241388	26.151
Tit	277	33	30.47	97	50	25.24	4.6611459	28.477

SOLEDAD, KERN COUNTY, CAL.

A butte 7 miles southeast of Mojave, around the eastern end of which the Southern Pacific Railroad passes. It can be best reached by road to the Grey Eagle mine and then by trail to summit.

Station mark: A bronze triangulation tablet cemented in solid rock, above which a cairn 10 feet high was erected.

[Latitude 34° 58′ 57.89″. Longitude 118° 11′ 17.68″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Odell	4	57	13.63	184	55	39.21	4.6893126	30.385
Liebre	47	01	04.14	226	47	46.03	4.6868484	.....
Frazier	72	21	45.60	251	54	58.97	4.8748714	.....
Double	101	35	48.84	281	25	36.86	4.4410062	.....
Pajuela	147	51	29.34	327	47	50.69	4.2581887	.....
Cache	168	06	58.16	348	04	51.10	4.4335946	.....
Bald	194	49	55.45	14	53	09.44	4.5222702	20.683
El Paso	209	53	02.77	30	05	02.10	4.8000085	39.207
Red	233	25	25.01	53	46	19.02	4.8354356	42.539
Pilot	242	01	24.95	62	34	41.94	4.9956979	61.525
Desert	243	17	04.79	63	25	40.99	4.4065554	15.845
Fremont	250	27	21.56	70	52	41.10	4.8510179	44.093
Rich	274	49	57.62	95	07	27.73	4.6689780	28.995
Muroc	282	58	51.58	103	09	32.71	4.4646310	18.113
Grey	317	47	32.86	138	03	29.17	4.8036980	39.541

TELESCOPE PEAK, INYO COUNTY, CAL. (Not occupied.)

The highest point of Panamint or Telescope Range. It is about 11 miles northeast of the town of Ballarat, and 23 miles southwest of Furnace Creek ranch in Death Valley. It is best reached from west side, following wagon road up Tuber Canyon. From end of road follow trail northeast to summit of "Baldy" Mountain, thence southward about 3 miles following a good trail along summit range. Animals may be taken to station when there is little or no snow. Station of Wheeler Survey, 1873 (?).

Station mark: Aluminum tablet cemented in slate stone 12 by 10 by 4 inches under cairn 4 feet base and 5 feet high. This is on site of small monument which was destroyed. No record of Wheeler station found.

[Urquhart, 1913: Latitude 36° 10′ 12.52″; longitude 117° 05′ 18.80″. Blackburn, 1907: Latitude 36° 10′ 12.88″; longitude 117° 05′ 20.24″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Pilot [a]	8	16	16.06	188	11	27.37	4.9375483	58.814
Red [a]	26	18	22.89	206	01	01.74	5.0065117	63.076
Argus [a]	42	32	20.67	222	19	44.31	4.6789270	29.667
Maturango	81	32	11.00	261	17	48.00	4.5681200	.....
Tin	157	41	10.00	337	26	44.00	4.9349500	.....
Death	174	17	17.00	354	15	50.00	4.5658200	.....
Grape	176	31	04.00	356	27	46.00	4.9467000	.....
Furnace	239	59	44.00	60	16	41.00	4.6941900	.....
Charleston	264	26	55.00	85	16	11.00	5.0996500	.....
Funeral	279	54	31.00	100	10	59.00	4.6286800	.....
Nopah	281	00	42.00	101	36	01.00	4.9668300	.....
Brown [a]	353	00	29.00	173	03	02.48	4.7326507	33.574

[a] Urquhart, 1913.

TIE FORT, SAN BERNARDINO COUNTY, CAL. (Not occupied.)

Signal was built, but as station was not occupied there is no available description.

Station mark: A cairn.

[Latitude 35° 16′ 59.07″. Longitude 116° 33′ 19.97″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Tit	5	20	22.46	185	17	53.12	4.8532216	44.317
Calico	38	59	02.03	218	49	17.15	4.6123915	25.453
Pilot	101	58	31.73	281	35	16.24	4.7940311	38.671
Brown	137	07	36.39	316	51	34.36	4.7870874	38.057
Avawatz	218	36	01.83	38	43	50.36	4.5141646	20.301
Kingston	229	32	00.26	49	54	19.71	4.8818844	47.341
Kelso	284	22	54.25	104	51	39.54	4.8935640	48.631
Cave	317	53	38.26	138	01	40.95	4.5005084	19.672

TIT, SAN BERNARDINO COUNTY, CAL.

No description available

[Latitude 34° 38′ 34.58″. Longitude 116° 37′ 40.57″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Sharp	97	50	25.24	277	33	30.47	4.6611459	28.477
Pilot	147	04	53.36	326	44	18.41	4.9996874	62.092
Calico	153	55	30.92	333	48	19.49	4.6394214	27.088
Tie Fort	185	17	53.12	5	20	22.46	4.8532216	44.317
Cave	210	20	37.60	30	31	05.40	4.7410748	34.231
Old Dad [a]	258	39	39.98	79	11	33.64	4.9401265	54.135

[a] Not adjusted.

VOLCANO, INYO COUNTY, CAL.

A round-top mountain, 4 miles east of Little Lake station on the Southern Pacific Railroad (Mojave and Owens Valley branch). From Little Lake on Owens Valley road 2 miles, thence east after crossing railroad until a dry lake about 1 mile from railroad is reached, thence across a sandy wash southeast until a well-defined drain is reached, up this drain to within a short distance of summit. Animals can be taken to summit.

Station mark: An 8-foot rock cairn.

Reference mark: Bronze triangulation tablet set 5 feet east of cairn.

[Latitude 35° 57′ 22.86″. Longitude 117° 49′ 51.34″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
El Paso	1	03	55.15	181	03	32.17	4.7273318	33.165
Owens	31	47	26.46	211	41	37.65	4.4534702	17.653
Argus	288	13	06.72	108	26	39.58	4.5636742	22.752
Pilot	318	21	02.16	138	42	12.91	4.9176920	51.409
Red	341	31	54.26	161	40	33.58	4.8513739	44.129

Ivanpah quadrangle.

SAN BERNARDINO COUNTY.

The positions in the following list were determined by L. F. Biggs in September and October, 1915, by extending triangulation from stations Clark, Olcott, and Kingston, on approximate North American datum. This base is weak and positions can not be accurately computed until connection has been made with well-determined points.

For stations in this scheme in Nevada, see Bulletin 644–M.

CLARK, SAN BERNARDINO COUNTY, CAL.

Described as follows in Bulletin 496, page 35:

Highest and most western peak on Clark Mountain, a well-known point about 25 miles northwest of Leastalk, a station on the San Pedro, Los Angeles & Salt Lake Railroad. The nearest water is at Benson's mine at foot of mountain on east side. There is a road from Leastalk to mine.

Signal: Cairn 6 feet high.

Station mark: Triangulation tablet set in rock 1 meter west of signal.

[Latitude 35° 31′ 31.98″. Longitude 115° 35′ 18.04″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Kingston	127	06	18.76	306	54	53.01	4.5693575	23.052
Green Monster	174	59	42.76	354	58	17.75	4.6218156	26.012
Ripley	177	45	02.95	357	44	35.38	4.4810177	18.809
Olcott	189	09	32.54	9	12	36.11	4.6942983	30.736
Shenandoah	191	13	51.51	11	16	37.81	4.5650049	22.822
Diablo Grande	212	36	11.41	32	40	54.31	4.3554467	14.086

KINGSTON,[1] SAN BERNARDINO COUNTY, CAL.

Described in Bulletin 496, pages 35 et seq., as follows:

On the highest point of Kingston Range. It is about 20 miles west-southwest of Sandy post office. The nearest known water is at Horse Spring, on the northeast side of the mountain.

Signal: Cairn 6 feet high, with tree in center.

Station mark: Triangulation tablet under center of cairn.

[Latitude 35° 43′ 36.58″. Longitude 115° 54′ 55.30″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Mesa	221	42	52.89	41	54	59.92	4.6689748	28.995
Green Monster	233	07	25.91	53	17	29.58	4.5097518	20.096
Olcott	234	34	49.68	54	49	23.12	4.6614279	28.496
Shenandoah	249	26	07.91	69	40	23.08	4.5932003	24.353
Diablo Grande	274	18	01.28	94	34	12.06	4.6225326	26.055
Clark	306	54	53.01	127	06	18.76	4.5693575	23.052

KNIGHTS WELL, SAN BERNARDINO COUNTY, CAL.

Station is west one of two pumps at Knights Well on the State Line road, 9 miles southeast of Ripley.

[Latitude 35° 41′ 42.42″. Longitude 115° 31′ 53.35″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Green Monster	159	00	20.84	338	56	55.93	4.3895211	15.236
Shenandoah	186	41	07.23	6	41	54.22	4.2387279	10.767
Diablo Grande	267	44	32.44	87	47	16.50	3.8496820	4.396

CORNER SECS. 1, 2, 35, AND 36, T. 18 N., R. 13 E., SAN BERNARDINO COUNTY, CAL.

Station is iron pipe on township line, west edge of State Line road, 7 miles southwest of Ripley.

Station mark: A regulation United States Land Office iron township-line post.

[Latitude 35° 43′ 17.71″. Longitude 115° 32′ 18.43″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Green Monster	157	46	10.68	337	43	00.38	4.3335927	13.395
Shenandoah	190	30	19.51	10	31	21.18	4.1618474	9.020
Diablo Grande	289	02	35.21	109	05	33.96	3.9109050	5.061

Santa Rosa and Sebastopol quadrangles.

NAPA AND SONOMA COUNTIES.

In the spring of 1914 C. F. Urquhart extended triangulation from Coast and Geodetic Survey stations Ross and Mount Helena so as to control all of Santa Rosa and part of Sebastopol 15′ quadrangles. Seven stations were occupied and four points were located by intersections, all based on North American datum.

[1] See p. 30.

BENNETT, SONOMA COUNTY, CAL. (Not occupied.)

A tree on highest point of Bennett Mountain, 6 miles east-southeast of Santa Rosa. Station mark: Center of signal tree.

[Latitude 38° 24′ 49.47″. Longitude 122° 37′ 27.29″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Cotati	26 33 36	206 30 52	4.15944	8.970
Taylor	72 05 42	252 03 51	3.65975	2.838
Hood	230 22 54	50 25 40	3.90905	5.040
Black	332 12 56	152 14 37	3.92712	5.254

BLACK, SONOMA COUNTY, CAL.

On highest point of Sonoma Mountain, near fence, between pasture and grain field, owned by Mrs. M. A. Black. It is about 0.75 mile north of the public road and about 8 miles north of Petaluma. The station can be reached with buckboard, the last 1.2 miles being over a private road which turns off at the Anderson place.

Station mark: Laurel sapling in cairn 5 feet in diameter.

Reference mark: An aluminum tablet set in a rock 6.7 feet west of signal.

[Latitude 38° 20′ 46.34″. Longitude 122° 34′ 44.99″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Cotati	62 26 30.19	242 22 04.83	4.0692896	7.289
West Hill	89 54 02.00	269 43 33.00	4.3891400	15.223
School	108 03 19.00	287 57 14.00	4.1725800	9.245
Ross	110 43 46.31	290 23 37.97	4.7021686	31.298
Taylor	126 16 22.28	306 12 50.32	4.0118458	6.386
Bennett	152 14 37.00	332 12 56.00	3.9271200	5.254
Mount Helena	172 36 04.38	352 34 04.34	4.5587256	22.494
Hood	190 21 43.71	10 22 42.98	4.1092648	7.991
Peak	168 03 56	348 02 00.00	4.3407700	13.618

COTATI, SONOMA COUNTY, CAL.

On highest point of a bald hill, in the Meacham pasture, about 2 miles west of Penn Grove, a station on the Northwestern Pacific Railroad, between Santa Rosa and Petaluma, and can be easily reached.

Station mark: The signal.

Reference mark: Tablet set in solid rock. Azimuth from signal to mark 124° 47′, distance 2.3 feet.

[Latitude 38° 17′ 50.62″. Longitude 122° 41′ 52.94″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
West	110 49 34.00	290 43 34.00	4.1787600	9.378
Ross	122 16 48.26	302 01 06.39	4.6380503	27.002
School	159 27 08.00	339 25 32.00	4.0299900	6.658
Santa Rosa	175 05 03.00	355 04 28.00	4.2018500	9.890
Taylor	190 20 09.74	10 21 03.42	4.0681581	7.270
Bennett	206 30 52.00	26 33 36.00	4.1594400	8.970
Black	242 22 04.83	63 26 30.19	4.0692896	7.289

MOUNT HELENA, NAPA COUNTY, CAL.

A station of the United States Coast and Geodetic Survey on the summit of Mount Helena, about 12 miles to the northward of Calistoga. The station was originally marked by a fine drill hole and cross in the top of a one-half-inch copper bolt

5 inches long, which was cemented in a drill hole in bedrock, and by a brick pier 3 bricks square and 43 inches high, built over the bolt. When visited in 1908 it was found that the pier had been dynamited. Other instrument piers are at the following distances and directions from the station: Collimator pier, 2 bricks square and 61 inches high, 2.27 meters northwest; transit pier, 2 by 3 bricks and 39 inches high, 17.04 meters southwest; latitude pier, 2 by 2½ bricks and 36 inches high, 17.74 meters southwest of the station and 1.68 meters east of the transit pier; vertical angle pier, 2 bricks square and 44 inches high, 33.31 meters southwest of the station and 16.92 meters a little south of east of the latitude pier. A boundary mark between Lake and Napa counties, a large drill hole in a basaltic rock, is 2.18 meters northwest of the station.

The brick pier spoken of in description has about all fallen down or been pulled down. Copper bolt was found. There is a good trail from Mount Helena down to summit of peak. The rim is on road from Calistoga to Middletown and 7 miles from former.

[Latitude 38° 40′ 11.080″. Longitude 122° 37′ 57.817″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Taylor	6 53 39.44	186 52 06.84	4.47769110	18.666
West Hill	28 51 43.00	208 43 19.00	4.61336000	25.510
Mount Lola	245 56 18.019	67 22 03.416	5.33015644	.....
Round Top	269 20 15.615	90 58 57.203	5.36002670	.....
Mount Diablo	324 01 34.822	144 28 18.913	5.03233246	.....
Hood	343 15 59.73	163 18 59.42	4.38512020	15.082
Black	352 34 04.34	172 36 04.38	4.55872560	22.494
Peak	359 27 11	179 27 12	4.16010000	8.984

HOOD, SONOMA COUNTY, CAL.

On Hood Mountain, 12 miles by road and trail east of Santa Rosa.

Signal and station mark: A small sapling in center of a cairn 5 feet in diameter, on highest point of mountain.

Reference mark: A tablet set in rock, 2 feet east of cairn.

[Latitude 38° 27′ 37.12″. Longitude 122° 33′ 09.58″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Black	10 22 42.98	190 21 43.71	4.1092648	7.991
Bennett	50 25 40.00	230 22 54.00	3.9090500	5.040
Taylor	58 13 01.52	238 08 29.99	4.0958674	7.748
Santa Rosa	81 02 50.00	260 56 49.00	4.1531800	8.842
Ross	95 59 51.24	275 38 42.01	4.6962906	30.877
Mount Helena	163 18 59.42	343 15 59.73	4.3851202	15.082

PEAK, SONOMA COUNTY, CAL. (Not occupied.)

A lone tree on north side of a round peak northeast of mark West Springs which is probably the nearest stopping place.

Station mark: Center of lone tree used for signal.

[Latitude 38° 32′ 22.18″. Longitude 122° 37′ 52.10″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Taylor	13 42 02	193 40 26	4.19900	9.825
Mount Helena	179 27 12	359 27 11	4.16010	8.984
Black	348 02 00	168 03 56	4.34077	13.618

ROSS MOUNTAIN, SONOMA COUNTY, CAL.

A station of the United States Coast and Geodetic Survey on the mountain locally known as Pole Mountain, on land belonging to Baker & Sons. It may be reached from Cazadero by a wagon road for about 3 miles to the ranch of W. H. Knowles and then about 2 miles by a good trail to the station. A good camping place with a fine spring of water is about one-fourth mile southeast and about 250 feet below the station.

Station mark: Copper bolt in the top of a concrete pier.

Reference marks: Three stones, each with a half-inch drill hole in the top, placed level with the surface of the ground and 6 feet from the station, one nearly in line to Tomales Bay, one toward Mount Helena, and the third toward Walalla. A charred oak stump with a wrought-iron nail in the top was 20 feet 4 inches N. 54° 01′ W. (true) from station.

Signal: A tree 49.9 feet distant trimmed up. All other timber higher than this was cut from summit of peak.

[Latitude 38° 30′ 20.583″. Longitude 123° 07′ 09.221″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Mount Helena[a]	246	36	09.171	66	54	21.548	4.6640160	.....
Hood	275	38	42.010	95	59	51.240	4.6962906	30.877
Taylor	286	30	03.900	106	46	40.640	4.6081249	25.204
Black	290	23	37.970	110	43	46.310	4.7021686	31.298
Cotati	302	01	06.390	122	16	48.260	4.6380503	27.002
Mount Diablo[a]	302	51	49.822	123	36	33.990	5.1013702	.....
Mount Tamalpais[a]	324	27	22.348	144	46	47.824	4.8984717	.....

[a] Coast Survey.

SANTA ROSA, SONOMA COUNTY, CAL. (Not occupied.)

Station mark: Center of gilded cupola on Santa Rosa Bank, side of street west of courthouse. (Not Santa Rosa National Bank.)

[Latitude 38° 26′ 24.91″. Longitude 122° 42′ 49.16″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Hood	260	56	49	81	02	50	4.15318	8.842
Taylor	321	27	28	141	28	57	3.74498	3.454
Cotati	355	04	28	175	05	03	4.20185	9.890

TAYLOR, SONOMA COUNTY, CAL.

On highest bald point of Taylor Mountain, a well-known mountain 3 miles south-southeast of Santa Rosa.

Signal and station mark: A tree in center of cairn.

Reference mark: A tablet in solid rock, true azimuth 23° 53′, distance 6.8 feet from signal.

[Latitude 38° 24′ 03.88″. Longitude 122° 40′ 26.43″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Cotati	10	21	03.42	190	20	09.74	4.0681581	7.270
West Hill	69	15	06.00	249	08	12.00	4.2388200	10.769
School	75	52	21.00	255	49	51.00	3.7812300	3.755
Ross	106	46	40.64	286	30	03.90	4.6081249	25.204
Santa Rosa	141	28	57.00	321	27	28.00	3.7449800	3.454
Mount Helena	186	52	06.84	6	53	39.44	4.4776911	18.666
Peak	193	40	26.00	13	42	02.00	4.1990000	9.825
Hood	238	08	29.99	58	13	01.52	4.0958674	7.748
Bennett	252	03	51.00	72	05	42.00	3.6597500	2.838
Black	306	12	50.32	126	16	22.28	4.0118458	6.386

TODD SCHOOL, SONOMA COUNTY, CAL.

The small one-story frame schoolhouse 4.5 miles south-southwest of Santa Rosa.
Station mark: Center of cupola.

[Latitude 38° 23′ 15.98″. Longitude 122° 44′ 27.88″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Taylor	255 49 51	75 52 21	3.78123	3.755
Black	287 57 12	108 03 15	4.17258	9.245
Cotati	339 25 32	159 27 08	4.02999	6.658

WEST HILL, SONOMA COUNTY, CAL. (Not occupied.)

A very high tree in grove on high point on ridge 5 or 6 miles west-southwest of Sebastopol.
Station mark: Center of tree.

[Latitude 38° 20′ 44.24″. Longitude 122° 51′ 33.84″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Mount Helena	208 43 19	28 51 43	4.61336	25.510
Taylor	249 08 12	69 15 06	4.23882	10.770
Black	269 43 33	89 54 02	4.38914	15.223
Cotati	290 43 34	110 49 34	4.17876	9.378

Banta, Butlers, Ceres, Cooperstown, Crows Landing, Denair, Dickinson, Empire, Hospital Creek, Lone Tree Creek, Modesto, Montpelier, Newman, Oakdale, Orestimba Creek, Patterson, Reservoir, Tracy, Waterford, Westley, and Westport 7½′ quadrangles; Bonanza, Capitola, Copperopolis, Gilroy, Hot Springs, Grevison Peak, Hollister, Morgan Hill, Mount Boardman, Mount Hamilton, and Pajaro 15′ quadrangles.

ALAMEDA, MERCED, MONTEREY, SAN BENITO, SAN JOAQUIN, SANTA CLARA, SANTA CRUZ, AND STANISLAUS COUNTIES.

The field work was done by C. F. Urquhart, topographic engineer, assisted by Roy B. Kilgore, jr., topographer, in October, November, and December, 1912, and January, February, May, and June, 1913. Sixty-three stations were occupied, four of which were stations of the Coast and Geodetic Survey, and 27 points were located by intersections. The control of twenty-one 7½′ quadrangles and ten 15′ quadrangles was completed, on North American datum. For points previously located, see Bulletin 551.

The work was done in cooperation with the State of California.

BAREILLAS, MERCED COUNTY, CAL.

On a bald peak, the lowest and most eastern of three peaks on land owned by J. C. Barreillas. It is about 3 miles a little east of south of the San Luis ranch, which is on the road between Los Banos and Hollister, about 15 miles from the former. The signal can be seen from this ranch.

Signal and station mark: A cairn 7 feet high.

Reference mark: A tablet set in rock, 1.72 meters south of signal.

[Latitude 37° 01′ 33.570″. Longitude 121° 02′ 19.456″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Santa Ana	52	17	14.01	232	10	14.11	4.3394995	13.578
Pacheco	84	55	47.40	264	46	49.16	4.3461620	13.788
Howard	133	51	38.01	313	45	06.23	4.3468888	13.811
Christian	165	13	30.43	345	11	30.55	4.2836434	11.940

BARTLETT, SANTA CRUZ COUNTY, CAL.

Station is on a sagebrush sand hill about half a mile northwest of Watsonville landing on the ocean. It is situated about 4 miles southwest of the town of Watsonville and can be reached in buggy.

Signal: A 4 by 4 inch redwood pole, 14 feet high, set 4½ feet in ground, with two targets at right angles to each other on pole.

Station mark: A tablet set in rock under center of signal.

[Latitude 36° 53′ 14.996″. Longitude 121° 49′ 48.109″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Lillian	167	14	50.16	347	13	55.96	4.0046368	6.280
Loma Prieta	177	15	03.64	357	14	34.56	4.3957141	15.455
Church	232	54	24.75	52	57	37.10	3.9971654	6.173
Watsonville	243	51	39.96	63	54	09.97	3.8381432	4.280
Lux	267	24	37.45	87	35	08.75	4.4160516	16.196
School	249	42	56.77	69	47	37.62	4.0913279	7.668
Pajaro	277	35	00.16	97	37	45.61	3.8380452	4.280
Gavilan	297	44	29.16	117	55	38.46	4.4955250	19.448

BATCHER, SANTA CLARA COUNTY, CAL.

This station is on a high ridge with scattering oak trees on it. It is on the highest point of ridge and about 3 miles southeast of Gilroy Hot Springs, a health resort, 14 miles from the town of Gilroy. The land is owned by Mr. Batcher, a San Francisco capitalist.

Station mark and signal: A laurel tree placed in ground and braced by four laurel poles.

Reference mark: A triangulation tablet set in rock and placed in ground 4.4 feet southwest of signal.

Instrument placed over tablet. True azimuth from station to reference mark, 22° 11′.

[Latitude 37° 05′ 44.077″. Longitude 121° 26′ 04.231″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Gavilan	11	25	24.44	191	22	19.95	4.5850532	23.900
Lux	22	46	36.68	202	42	52.69	4.3766676	14.792
Thompson	51	33	25.41	231	26	52.85	4.3134420	12.788
Loma Prieta	92	52	57.61	272	38	09.52	4.5610335	22.614
Corral	107	10	21.70	287	07	28.41	3.8705606	4.612
Lick	146	00	42.20	325	53	09.81	4.5176506	20.465
Madrone	152	02	08.73	331	59	16.73	4.1753466	9.305
Mocho	165	59	12.58	345	47	49.34	4.6408546	27.177
Gerber	185	21	58.69	5	22	56.86	4.4033932	15.731
Orestimba	216	11	39.40	36	19	15.29	4.4973537	19.530
Castle	224	12	51.29	44	18	05.20	4.2642706	11.419
Howard	248	06	28.73	68	14	16.67	4.3141378	12.808
Pacheco	306	28	41.90	126	34	01.70	4.2126976	10.140
Santa Ana	319	32	23.27	139	39	40.49	4.4427328	17.222

BELL, SAN JOAQUIN COUNTY, CAL.

A windmill situated near a flat-topped red tank, on land owned by Mr. W. E. Moore, about 6 miles west of Tipon, a station of the Southern Pacific Railroad.

Station mark: Center of windmill tower.

[Latitude 37° 44′ 42.351″. Longitude 121° 13′ 55.813″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Vernalis	18	45	27.11	198	43	35.73	4.1427815	8.632
Moy	44	06	24.85	224	01	00.34	4.2719258	11.622
Ripon	273	47	54.43	93	51	53.45	3.9814538	5.954
Mill	305	43	09.28	125	44	37.02	3.6359280	2.687
Kern	359	20	14.90	179	20	22.88	4.4434398	17.250

BLACK GULCH, STANISLAUS COUNTY, CAL.

On highest point of mountain, 6 miles west of Patterson, which can be reached by following road which leads due west from Patterson 3 miles, then to the southwest up Black Gulch about one-fourth mile beyond deserted cabin where dim road turns to the right to lone deserted cabin up gulch. From this point follow up ridge to right to signal.

Signal and station mark: A cairn 7 feet high.

Reference mark: A bronze triangulation tablet set in rock, 6.1 feet east of center of signal.

True azimuth, station to reference mark, 277° 00′.

[Latitude 37° 27′ 02.070.″ Longitude 121° 13′ 28.246″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Orestimba	0	12	48.64	180	12	47.35	4.1477756	8.732
Gerber	48	53	20.91	228	46	40.27	4.3336888	13.398
Red	78	05	36.20	257	57	01.93	4.3276709	13.214
Oso	115	45	06.50	295	39	40.03	4.1652690	9.091
Vernalis	165	14	54.87	345	12	47.07	4.3053402	12.551
Kern	175	52	00.32	355	51	51.50	3.6938497	3.070
Westley	192	12	04.43	12	13	00.52	4.0295501	6.651
Grayson	197	54	02.07	17	55	42.38	4.1190908	8.174
School (Haight)	218	23	47.29	38	25	33.08	3.8373690	4.273
Modesto	224	01	54.73	44	10	28.63	4.4734037	18.482
Van Ormer	230	58	48.22	51	01	35.47	3.9390751	5.400
Westport	236	41	50.42	56	48	56.84	4.3132812	12.783
Patterson	253	49	08.71	73	52	30.56	3.9289646	5.276
Joven	257	11	12.75	77	19	40.86	4.3230684	13.074
Turlock	261	28	27.24	81	42	29.84	4.5365767	21.376
Crows Landing	295	51	45.92	115	57	16.84	4.1727906	9.250
Newman	310	19	24.09	130	26	41.98	4.3672457	14.474
Crow	326	28	58.19	146	31	47.61	4.0944841	7.724
Cleveland	337	31	47.10	157	35	11.81	4.3373999	13.513

BLOODSOE, MERCED COUNTY, CAL.

A lumber tripod on pasture hill on G. W. Bloodsoe's ranch. The nearest stopping place is Hickman, 6 miles southeast of Montpelier, on the Santa Fe Railway.

Station mark: An iron bench-mark post set under center of tripod.

[Latitude 37° 30′ 47.722″. Longitude 120° 35′ 58.085″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Dallas	80	42	32.53	260	37	20.87	4.1052710	7.918
Montpelier	112	53	39.21	292	49	43.77	4.0127644	6.399
School (Dickinson)	190	32	07.44	10	32	27.15	3.6375436	2.697
Pillsbury	201	48	35.94	21	49	55.12	3.9334675	5.331
Holmes	223	33	10.67	43	36	56.90	4.1210219	8.211
Thomsen	256	58	57.48	77	02	28.17	3.9403839	5.417

BROWN, ALAMEDA COUNTY, CAL.

Situated on a high prairie point in pasture land owned by Mr. Brown. It is best reached from Livermore via road up Mocho Creek to summit of ridge; thence a road turns northwest and passes very near station.

Station mark: A small pile of rock around signal tree and over a tablet.

[1901: Latitude 37° 36′ 22.98″; longitude 121° 37′ 10.84″. 1913: Latitude 37° 36′ 22.978″; longitude 121° 37′ 10.775″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Trenouth	61	53	05.56	241	43	55.02	4.4006441	.....
Sunol	93	25	59.84	273	14	56.27	4.4266916	.....
Wiedeman	114	04	36.83	293	50	52.92	4.5581580	.....
Brushy	157	51	19.54	337	48	17.29	4.2868343	.....
Byron	172	32	14.88	352	30	27.36	4.5189234	.....
Bridge	195	00	51.94	15	03	31.56	4.3915751	.....
Tracy	230	32	57.01	50	40	23.58	4.3649212	14.397
Oso	236	38	36.81	116	47	36.87	4.3864221	15.128
Mocho	338	14	25.24	158	16	46.61	4.1868513	9.554

BUTLERS, STANISLAUS COUNTY, CAL.

A line windmill, situated on the south side of the road, 7 miles due west of Modesto, on land owned by Mrs. Butler. The windmill tower has been wrapped with white cloth.

Station mark: Center of windmill tower.

[Latitude 37° 38′ 17.540″. Longitude 121° 07′ 04.155″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Kern	31	38	28.36	211	34	25.35	4.2710137	11.597
Vernalis	84	58	45.18	264	52	42.58	4.1648865	9.083
Patrick	123	04	06.47	303	02	14.68	3.7285138	3.326
Theobald	266	23	21.34	86	24	59.53	3.5965564	2.454
Modesto	267	14	28.77	87	19	09.20	4.0519460	7.003
Young	321	26	56.94	141	27	59.09	3.6027343	2.489

CASHMAN, STANISLAUS COUNTY, CAL.

A timber tripod on summit of small sharp butte, about 8 miles east of Oakdale, on land owned by Mr. T. J. Cashman.

Station mark: A bench-mark post set under center of tripod.

[Latitude 37° 46′ 02.394″. Longitude 120° 41′ 31.459″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Walters	22	40	22.24	202	39	35.26	3.6880395	3.030
Levison	51	52	47.23	231	47	45.15	4.1868793	9.555
Windmill	64	29	50.20	244	27	10.84	3.8488699	4.388
Crane	79	48	22.76	259	41	28.21	4.2264375	10.466
Riverbank	80	13	53.03	260	04	53.32	4.3405264	13.611
Oakdale Church	89	12	06.09	269	06	18.83	4.1423894	8.625
Oakdale	102	08	21.47	282	02	20.13	4.1691066	9.172
Wolfling	301	00	51.30	121	03	27.86	3.8636908	4.540
No. 1	327	53	45.51	147	56	52.65	4.1494960	8.767
Hagen	358	50	45.45	178	50	53.43	4.2009964	9.871

CASTLE, STANISLAUS COUNTY, CAL. (Not occupied.)

Highest point of prominent mountain 5 miles northwest of Howard triangulation station.

[Latitude 37° 12′ 51.025″. Longitude 121° 17′ 24.493″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Batcher	44	18	05.20	224	12	51.29	4.2642706	11.419
Madrone	90	14	41.74	270	06	35.17	4.2974719	12.326
Gerber	139	07	24.10	319	03	07.61	4.2023768	9.902
Orestimba	205	19	00.35	25	21	22.13	4.1296786	8.376
Howard	311	04	59.38	131	07	33.80	3.9223223	5.196
Pacheco	359	19	05.49	179	19	12.14	4.3593694	14.214

CERES, STANISLAUS COUNTY, CAL.

Red tank in town of Ceres on the Southern Pacific Railroad.

Station mark: Center of tank.

[Latitude 37° 35′ 24.871″. Longitude 120° 57′ 10.546″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Joven	17	52	05.76	197	50	38.94	4.0572643	7.089
Westport	58	11	32.38	238	08	43.34	3.9034910	4.976
Courtney	88	22	57.37	268	19	55.10	3.8653274	4.557
Modesto	150	38	31.37	330	37	09.32	3.8275030	4.177
Hughson	264	09	13.06	84	12	26.12	3.8922953	4.849
Turlock	316	17	10.62	136	21	18.80	4.1606864	8.996
Keyes	318	20	07.71	138	21	43.00	3.7611671	3.585

CHRISTIAN, MERCED COUNTY, CAL.

On highest summit of bald, round hill, locally known as Christian Hill, on land owned by Simon Newman Co., about 7 miles southwest of town of Gustine, a station on the Southern Pacific Railroad, and half a mile west of ranch owned by J. F. Schnyder. Can be reached from Schnyder's ranch on horseback.

Station mark: A 4 by 4 inch redwood pole, 14 feet high, with three cross targets, and is sunk in the ground a depth of 3 feet.

Reference mark: A bronze triangulation tablet, set in rock 4.6 feet northwest of signal and station mark.

True azimuth, station to reference mark: 163° 56′.

[Latitude 37° 11′ 36.236″. Longitude 121° 05′ 38.142″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Howard	74	01	28.25	253	56	55.78	4.0633837	7.190
Orestimba	141	16	09.99	321	11	24.08	4.2691191	11.547
Cleveland	158	49	17.23	338	47	56.90	3.9568293	5.626
Crow	165	29	11.90	345	27	16.10	4.2736010	11.667
Newman	204	41	18.77	24	43	50.78	4.1704023	9.199
Gustine	230	36	21.94	50	39	43.78	4.0269475	6.611
Stack	260	34	00.83	80	38	10.83	4.0143355	6.422
Barreillas	345	11	30.55	165	13	30.43	4.2836434	11.940

CHURCH, SANTA CRUZ COUNTY, CAL. (Not occupied.)

A church 2 miles northeast of Watsonville, Cal.

[Latitude 36° 56′ 29.254″. Longitude 121° 44′ 27.855″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Pajaro	9	05	29.07	189	05	02.29	3.8443243	4.342
Bartlett	52	57	37.10	232	54	24.75	3.9971654	6.173
Gavilan	316	10	02.62	136	18	00.26	4.4552729	17.726

CLAUS, STANISLAUS COUNTY, CAL.

A red water tank in Claus, belonging to the Santa Fe Railway. It can be occupied. Station mark: Center of tank.

[Latitude 37° 41′ 12.238″. Longitude 120° 55′ 05.734″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Modesto	52	39	33.91	232	36	55.50	3.9027590	4.967
Stack	121	19	54.51	301	17	25.26	3.8449099	4.348
Riverbank	162	25	13.61	342	24	32.45	3.7368615	3.390
Empire	344	29	23.22	164	29	59.00	3.7298971	3.336

CLEVELAND, STANISLAUS COUNTY, CAL.

On a low cultivated hill on land owned by Mrs. John Miller, and a quarter mile north of her ranch house. About three-fourths mile north of Cleveland District School and 8 miles west of Gustine, a station on the Southern Pacific Railroad.

Signal: A 4 by 4 inch redwood pole, 14 feet long, with 3 feet cross targets and placed in the ground a depth of 3 feet.

Station mark: Center of 4 by 4 inch pole.

[Latitude 37° 16′ 10.069″. Longitude 121° 07′ 50.897″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Howard	34	00	54.30	213	57	41.89	4.1470847	8.718
Orestimba	125	54	13.50	305	50	47.80	4.0136237	6.412
Black Gulch	157	35	11.81	337	31	47.10	4.3373999	13.513
Crow	171	35	42.08	351	35	06.66	3.9929778	6.114
Newman	242	03	43.93	62	07	36.52	4.0293702	6.648
Gustine	278	20	24.12	98	25	06.52	4.0650988	7.219
Stack	296	35	36.71	116	41	07.26	4.1779102	9.360
Christian	338	47	56.90	158	49	17.23	3.9568293	5.626

CORRAL, SANTA CLARA COUNTY, CAL.

Station is on highest point of ridge about 3 or 4 miles west of Gilroy Hot Springs, a health resort, 14 miles from the town of Gilroy, a station on the Southern Pacific Railroad. Land is owned by Mr. Hyde, or has been sold to Mr. Batcher. The "Diamond Fields" trail from Gilroy Hot Springs goes to Summit of ridge, thence west along ridge to a corral. Signal is about a quarter mile north of corral.

Signal: An oak tree 40 or 50 feet high, with all limbs except the top cut off. A triangle is cut in the east side of tree with U. S. printed in nails on it.

As the Santa Clara Valley can not be seen from this point, a line was measured 618.4 feet west to summit of hill overlooking the valley; at this point a United States Geo-

logical Survey triangulation tablet was set in rock and placed in ground. Triangles were blazed on two trees north and northwest of triangulation tablet, distant about 30 feet each from tablet.

[Latitude 37° 06′ 55.073″; longitude 121° 30′ 51.479″. Tablet on hill west: Latitude 37° 06′ 55.539″; longitude 121° 30′ 58.400″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Lux	4	58	50.16	184	57	59.01	4.3844156	15.058
Thompson	31	00	48.97	210	57	09.38	4.2429236	10.871
Madonna	56	01	05.73	235	54	15.52	4.3073100	12.608
Loma Prieta	89	14	39.97	269	02	45.00	4.4662553	18.180
Murphy	92	36	38.28	272	30	54.59	4.1484306	8.745
Lick	155	41	29.67	335	36	50.95	4.4401055	17.118
Madrone	180	18	55.27	00	18	56.76	4.0427551	6.857
Batcher	287	07	28.41	107	10	21.70	3.8705606	4.612
Pacheco	300	25	26.87	120	33	39.86	4.3702019	14.573

COURTNEY, STANISLAUS COUNTY, CAL.

A windmill on Mr. Courtney's ranch, 4½ miles west of Ceres.

Station mark: Center of windmill tower.

[Latitude 37° 35′ 18.050″. Longitude 121° 02′ 09.346″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Kern	58	43	43.43	238	36	40.92	4.2994734	12.383
Modesto	213	34	59.53	33	36	39.86	3.8624533	4.527
Ceres	268	19	55.10	88	22	57.37	3.8653274	4.557
Westport	352	28	57.79	172	29	10.94	3.6072166	2.515

CRANE, STANISLAUS COUNTY, CAL.

A tall wooden windmill, 3 miles east of Riverbank, a town on the Santa Fe Railway, on J. W. Crane's place. It can be occupied for some sights.

Station mark: Center of windmill tower.

[Latitude 37° 44′ 25.166″. Longitude 120° 52′ 48.539″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Modesto	42	00	05.95	221	56	03.58	4.1620978	9.025
Riverbank	81	31	50.43	261	29	45.28	3.7043614	3.146
Oakdale	199	19	16.46	19	20	09.91	3.8097394	4.010
Cashman	259	41	28.21	79	48	22.76	4.2264375	10.466
Windmill	270	13	02.71	90	17	17.82	4.0088101	6.341
Walters	275	46	52.64	95	53	00.04	4.1695734	9.182
Levison	325	21	19.88	145	23	12.05	3.8978509	4.911

CROW, STANISLAUS COUNTY, CAL.

On highest point of round foothill 5 miles southwest of Crows Landing, just south of Crow Creek, on land owned by George Crow and 1½ miles north of his ranch house. Can drive to foot of hill from almost any direction.

Station mark and signal: A 4 by 4 inch redwood pole, 10 feet long with 3 feet cross targets and set 3 feet in the ground.

Reference mark: A bronze triangulation tablet set in rock 3.9 feet south of signal.

True azimuth, station to reference mark 355° 11′.

[Latitude 37° 21′ 25.814″. Longitude 121° 08′ 49.339″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Orestimba	61	58	05.31	241	55	14.85	3.8942543	4.871
Black Gulch	146	31	47.61	326	28	58.19	4.0944841	7.724
Kern	154	46	22.64	334	43	24.32	4.2281635	10.508
Patterson	185	50	14.80	5	50	46.97	4.1070391	7.950
Crows Landing	239	24	05.94	59	26	47.20	3.8803463	4.717
Newman	293	25	33.12	113	30	01.38	4.0744560	7.376
Christian	345	27	16.10	165	29	11.90	4.2736010	11.667
Cleveland	351	35	06.66	171	35	42.08	3.9929778	6.114

CROWS LANDING, STANISLAUS COUNTY, CAL. (Not occupied.)

The most southern church in Crows Landing.

Station mark: Center of church spire.

[Latitude 37° 23′ 31.082″. Longitude 121° 04′ 23.685″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Crow	59	26	47.20	239	24	05.94	3.8803463	4.717
Black Gulch	115	57	16.84	295	51	45.92	4.1727906	9.250
Kern	129	48	19.60	309	42	39.70	4.2522857	11.108

DALLAS, STANISLAUS AND MERCED COUNTIES, CAL.

A lumber tripod on Mrs. Hickman's land, about 5½ miles due east of Turlock and 500 feet north of county road running from Turlock to Snelling.

Station mark: A triangulation tablet set in rock under center of tripod.

[Latitude 37° 29′ 40.680″. Longitude 120° 44′ 30.025″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Turlock	90	57	36.79	270	54	01.77	3.9384440	5.393
Denair	130	01	28.82	309	59	36.85	3.7705831	3.664
Hughson	136	19	31.09	316	15	00.47	4.1979657	9.802
Waterford	174	35	51.39	354	35	12.58	4.2193571	10.297
Hickman	177	34	41.00	357	34	26.03	4.1537439	8.853
Hall	185	50	35.07	5	51	00.47	4.0021038	6.244
Hagen	198	05	21.48	18	07	18.28	4.1799298	9.403
Pillsbury	237	27	50.42	57	34	21.51	4.2713761	11.607
School (Dickinson)	244	35	45.38	64	41	16.89	4.1699578	9.190
Bloodsoe	260	37	20.87	80	42	32.53	4.1052710	7.918

DENAIR, STANISLAUS COUNTY, CAL. (Not occupied.)

Station mark: Cupola on school in Denair, a station on the Santa Fe Railway.

[Latitude 37° 31′ 43.642″. Longitude 120° 47′ 33.916″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Turlock	48	44	43.35	228	43	00.23	3.7430046	3.438
Hughson	140	01	42.92	319	59	04.31	3.9971780	6.173
Hall	221	43	20.14	41	45	37.54	3.9199441	5.168
Dallas	309	59	36.85	130	01	28.83	3.7705831	3.664

DICKINSON SCHOOL, MERCED COUNTY, CAL. (Not occupied.)

Station Mark: Center of cupola on Dickinson School, 6 miles east of Montpelier, on the Santa Fe Railway.

[Latitude 37° 33′ 06.140″. Longitude 120° 35′ 25.752″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Bloodsoe	10	32	27.15	190	32	07.44	3.6375436	2.697
Dallas	64	41	16.89	244	35	45.38	4.1699678	9.190
Hagen	132	57	49.01	312	54	13.90	4.0725356	7.343
No. 1	173	01	27.47	353	00	50.99	4.0815762	7.493
Pillsbury	212	55	19.36	32	56	18.86	3.6439801	2.737
Thomsen	286	39	47.29	106	42	58.36	3.9050916	4.994

EMPIRE, STANISLAUS COUNTY, CAL. (Not occupied.)

A church spire in Empire, a station on the Santa Fe Railroad. Station mark: Center of spire.

[Latitude 37° 38′ 24.426″. Longitude 120° 54′ 07.174″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Modesto	92	23	49.57	272	20	35.48	3.8919838	4.845
Riverbank	163	27	24.33	343	26	07.39	4.0343524	6.725
Claus	164	29	59.00	344	29	23.22	3.7298971	3.336
Levison	234	15	33.63	54	18	13.69	3.8981668	4.915
Hughson	325	27	50.44	145	29	11.67	3.7603148	3.578

GAVILAN, MONTEREY COUNTY, CAL.

A station of the Coast and Geodetic Survey on the crest of the mountain separating Pajaro Valley from the Valley of Salinas and about 4 miles to the southward of the Mission of San Juan. The crest is composed of a line of sharp peaks from 2,800 to 3,000 feet high, and the station is on the western extremity, on a small platform of level land just where the ground commences to fall rapidly. The station was marked by a stone block, with a drill hole in the top, filled with lead, set 2½ feet below the surface of the ground. Three lead bolts in fixed rocks are as follows: One 13 feet 2 inches south by west (approximately), one 13 feet 9 inches southeast (approximately), and one 5 feet 9 inches north by east (approximately), from the center.

[Latitude 36° 45′ 20.910″. Longitude 121° 31′ 11.350″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Bartlett	117	55	38.46	297	44	29.16	4.4955250	19.448
Pajaro	123	23	12.42	303	14	48.39	4.3970080	15.501
Watsonville	129	28	26.40	309	19	46.67	4.4440520	17.274
Church	136	18	00.26	316	10	02.62	4.4552729	17.726
School	139	38	05.18	319	31	36.00	4.3945269	15.413
Loma Prieta	143	56	25.47	323	44	45.39	4.6890356	30.366
Thompson	161	06	14.56	351	02	47.79	4.4202423	16.353
Lick	170	31	19.45	350	26	53.84	4.8188815	40.948
Lux	174	09	25.86	354	08	46.82	4.1995939	9.839
Batcher	191	22	19.95	11	25	24.44	4.5850534	23.900
Pacheco	216	28	36.92	36	36	59.77	4.5421347	21.651
Santa Ana	236	58	11.66	57	08	31.24	4.4846064	18.965

GERBER, SANTA CLARA AND STANISLAUS COUNTIES, CAL.

Station is on highest point of a high brushy mountain on east side of San Antonio Valley, and near the source of San Antonio Creek. It is about 4 miles from Mr. Gerber's ranch in San Antonio Valley. This valley can be reached by wagon road from Mount Hamilton and from Livermore. The best road is via Livermore and there is a very good trail from Gerber's ranch to signal.

Station mark and signal: A juniper tree set 3½ feet in ground.

Reference mark: A triangulation tablet cemented in rock placed in ground 3.2 feet from signal. Instrument was placed over center of tablet.

True azimuth, station to reference mark 18° 07′.

[Latitude 37° 19′ 21.678″. Longitude 121° 24′ 28.069″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Batcher	5	22	56.86	185	21	58.69	4.4033932	15.731
Madrone	38	06	22.19	218	02	31.51	4.1824226	9.457
Loma Prieta	58	53	42.45	238	37	53.85	4.6553767	28.101
Lick	95	47	41.42	275	39	09.52	4.3198304	12.977
Mocho	142	51	14.33	322	45	51.99	4.3343459	13.418
Red	154	54	11.81	334	52	18.76	4.0334548	6.711
Oso	188	23	09.54	8	24	24.45	4.3172692	12.901
Black Gulch	228	46	40.27	48	53	20.91	4.3336888	13.398
Orestimba	269	26	56.51	89	33	35.28	4.2093470	10.062
Howard	316	17	12.91	136	24	03.87	4.3846073	15.065
Castle	319	03	07.61	139	07	24.10	4.2023768	9.902
Pacheco	342	53	33.88	162	57	56.42	4.5626024	22.696

GILROY, SANTA CLARA COUNTY, CAL. (Not occupied.)

Catholic Church in Gilroy.

Station mark: Center of spire.

[Latitude 37° 01′ 00.304″. Longitude 121° 34′ 22.514″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Thompson	43	03	13.40	223	01	41.06	3.7449825	3.454
Loma Prieta	113	39	26.77	293	29	39.81	4.4191614	16.312
Murphy	142	35	17.03	322	31	40.94	4.1633691	9.051
Lux	346	42	06.63	166	43	22.42	4.1325515	8.431

GRAYSON, STANISLAUS COUNTY, CAL. (Not occupied.)

Church in old town of Grayson on west side of San Joaquin River, near town of Westley.

Station mark: Center of church spire.

[Latitude 37° 33′ 48.090″. Longitude 121° 10′ 43.495″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Black Gulch	17	55	42.38	197	54	02.07	4.1190908	8.174
Kern	30	07	40.30	210	05	51.11	3.9431290	5.451
Oso	70	20	29.37	250	13	22.11	4.2622189	11.365

GUSTINE, MERCED COUNTY, CAL. (Not occupied.)

Station mark: Center of steeple on church in town of Gustine on Southern Pacific Railroad.

[Latitude 37° 15′ 15.154″. Longitude 121° 00′ 04.475″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Christian	50	39	43.78	230	36	21.94	4.0269475	6.611
Howard	62	52	09.21	242	44	14.78	4.3374611	13.515
Cleveland	98	25	06.52	278	20	24.12	4.0650988	7.219
Orestimba	111	22	06.63	291	13	58.38	4.3285122	13.239

HAGEN, STANISLAUS COUNTY, CAL.

A 6 by 6 inch post with cross targets, on north edge of Martin Hagen's ranch. Located just east of high power line pole and on fence line, 3½ miles due east of Hickman.

Station mark: An iron bench-mark post set at foot of wood post.

[Latitude 37° 37′ 27.244″. Longitude 120° 41′ 18.412″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Montpelier	11	02	58.60	191	02	18.25	3.9280379	5.265
Dallas	18	07	18.28	198	05	21.48	4.1799298	9.403
Hall	39	58	48.31	219	57	16.83	3.7577625	3.557
Turlock	43	14	28.32	223	08	56.18	4.2908557	12.140
Hughson	79	13	40.95	259	07	13.01	4.2006798	9.863
Hickman	88	24	32.34	268	22	20.38	3.7245243	3.295
Modesto	94	34	04.27	274	23	00.81	4.4268888	16.605
Waterford	108	40	58.32	288	38	22.45	3.8199323	4.105
Levison	117	13	50.24	297	08	40.68	4.1450398	8.677
Walters	169	03	59.99	349	03	05.11	4.0642228	7.204
Cashman	178	50	53.43	358	50	45.45	4.2009964	9.871
Wolfling	206	07	22.24	26	09	50.57	4.1302031	8.386
No. 1	241	17	56.02	61	20	54.88	3.9129691	5.085
Pillsbury	291	28	11.62	111	32	46.36	4.0744735	7.376
School (Dickinson)	312	54	13.90	132	57	49.01	4.0725356	7.343

HAIGHT SCHOOL, STANISLAUS COUNTY, CAL.

Haight School, about 2 miles west of Vanormer, on the Southern Pacific Railroad.

Station mark: Center of belfry.

[Latitude 37° 29′ 56.850″. Longitude 121° 10′ 34.370″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Black Gulch	38	25	33.08	218	23	47.29	3.8373690	4.273
Kern	84	20	32.03	264	18	37.36	3.6674577	2.889

HALL, STANISLAUS COUNTY, CAL.

A round observatory on Mrs. Hall's home, a white house 3 miles southeast of Hickman, a station on the Santa Fe Railway.

Station mark: Center of observatory.

[Latitude 37° 35′ 04.927″. Longitude 120° 43′ 48.331″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Dallas	5	51	00.47	185	50	35.07	4.0021038	6.244
Denair	41	45	37.64	221	43	20.14	3.9199441	5.168
Turlock	44	33	56.05	224	29	55.41	4.1406707	8.591
Hughson	96	46	12.63	276	41	16.31	4.0791821	7.456
Levison	140	56	08.69	320	52	30.80	4.1422234	8.621
Hickman (2)	159	01	49.26	339	01	08.84	3.6570022	2.821
Waterford	158	20	15.83	338	19	11.54	3.8448338	4.347
Hagen	219	57	16.83	39	58	48.31	3.7577625	3.557
Montpelier	332	22	17.53	152	23	08.60	3.6467811	2.755

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HICKMAN, STANISLAUS COUNTY, CAL.

A church spire in town of Hickman.

Station mark: Center of spire.

[Latitude 37° 37′ 22.413″. Longitude 120° 44′ 54.577″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Turlock	29	48	51.82	209	45	31.46	4.2105739	10.091
Hughson	74	38	38.86	254	34	22.84	4.0282561	6.632
Hagen	268	22	20.38	88	24	32.34	3.7245243	3.295
Hall	339	01	08.84	159	01	49.26	3.6570022	2.821
Dallas	357	34	26.03	177	34	41.00	4.1537439	8.853

HOLMES, STANISLAUS COUNTY, CAL. (Not occupied.)

A dismantled wooden windmill near old deserted house on hill about 6 miles south west of La Grange, known as the old "Jim Holmes" place.

Station mark: Center of windmill tower.

[Latitude 37° 35′ 58.186″. Longitude 120° 29′ 46.936″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Thomsen	4	39	10.64	184	38	55.26	3.8829431	4.746
Bloodsoe	43	36	56.90	223	33	10.67	4.1210219	8.211
Pillsbury	74	49	58.29	254	47	31.13	3.7876239	3.810
No. 1	124	21	19.39	304	17	16.02	4.0731554	7.354
Russian	152	27	10.24	332	25	20.57	3.9784706	5.913

HOWARD, SANTA CLARA COUNTY, CAL.

On high point of ridge with scattering oak trees, on divide between Quinto and Romero creeks. The highest point of ridge is round brushy hill with lone tree on southwest side, 1 mile west of station. Can be reached from Howard Cattle Co.'s ranch, 10 miles west of Gustine, by following up Quinto Creek about 5 miles to cabin, thence by trail on up creek about 2 miles to sulphur spring to south end of trail. Follow up ridge here about 1½ miles southwest to station.

Signal and station mark: An oak tree 13 feet high, placed 3 feet in the ground.

Reference mark: A bronze triangulation tablet set in rock 4.3 feet northwest of signal.

True azimuth, station to reference mark, 110° 21′.

[Latitude 37° 09′ 52.689″. Longitude 121° 13′ 09.023″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Santa Ana	2	24	01.10	182	23	31.76	4.4593361	17.893
Pacheco	19	10	52.12	199	08	24.71	4.2647058	11.430
Batcher	68	14	16.67	248	06	28.73	4.3141378	12.808
Madrone	102	05	34.46	281	54	53.74	4.4269767	16.609
Castle	131	07	33.80	311	04	59.38	3.9223223	5.196
Gerber	136	24	03.87	316	17	12.91	4.3846073	15.065
Orestimba	178	17	49.68	358	17	36.76	4.2476912	10.991
Cleveland	213	57	41.89	34	00	54.30	4.1470847	8.718
Gustine	242	44	14.78	62	52	09.21	4.3374611	13.515
Christian	253	56	55.78	74	01	28.25	4.0633837	7.190
Bareillas	313	45	06.23	133	51	38.01	4.3468888	13.811

HUGHSON, STANISLAUS COUNTY, CAL.

Flagpole on flat-roofed hotel in Hughson, a town on the Santa Fe Railway.

Station mark: Center of flagpole.

[Latitude 37° 35′ 50.536″. Longitude 120° 51′ 54.092″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Keyes	37	37	26.18	217	35	48.50	3.8089621	4.002
Ceres	84	12	26.12	264	09	13.06	3.8922953	4.849
Modesto	114	39	26.48	294	34	51.25	4.0850366	7.558
Empire	145	29	11.67	325	27	50.44	3.7603148	3.578
Levison	198	38	43.46	18	40	02.18	3.9948177	6.140
Waterford	241	19	38.04	61	23	30.26	4.0265409	6.605
Hickman	254	34	22.84	74	38	38.86	4.0282561	6.632
Hagen	259	07	13.01	79	13	40.95	4.2006798	9.863
Hall	276	41	16.31	96	46	12.63	4.0791821	7.456
Montpelier	290	50	38.36	110	56	25.64	4.1749079	9.295
Dallas	316	15	00.47	136	19	31.09	4.1979657	9.802
Denair	319	59	04.31	140	01	42.92	3.9971780	6.173
Turlock	348	47	37.56	168	48	32.91	4.0599436	7.133

JACKSON, STANISLAUS COUNTY, CAL.

Cupola on Jackson School, 3 miles southwest of Salida, a station on the Southern Pacific Railroad.

Station mark: Center of cupola.

[Latitude 37° 41′ 19.378″. Longitude 121° 07′ 53.941″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Kern	21	43	51.83	201	40	19.05	4.3644007	14.380
Patrick	50	33	06.38	230	31	44.96	3.6261328	2.627
Salida	240	06	26.11	60	08	09.08	3.6773654	2.956

JOVEN, STANISLAUS COUNTY, CAL.

A wooden windmill just east of flat-roofed tank house, which may be occupied, 9 miles west of Turlock, on Mr. Young's place.

Station mark: Center of windmill tower.

[Latitude 37° 29′ 32.613″. Longitude 120° 59′ 33.051″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Orestimba	47	50	13.43	227	41	44.76	4.4442363	17.282
Black Gulch	77	19	40.86	257	11	12.75	4.3230684	13.074
Kern	90	51	39.27	270	43	02.08	4.3196253	12.971
Westport	153	30	57.60	333	29	35.53	3.8701367	4.608
Modesto	180	40	44.22	0	40	49.16	4.2232140	10.389
Ceres	197	50	38.94	17	52	05.76	4.0572643	7.089
Keyes	228	13	21.81	48	16	23.77	3.9927314	6.111
Turlock	268	18	03.75	88	23	38.38	4.1306910	8.395

KEYES, STANISLAUS COUNTY, CAL. (Not occupied.)

Cupola on school in Keyes, on the Southern Pacific Railroad.

Station mark: Center of cupola.

[Latitude 37° 33′ 05.027″. Longitude 120° 54′ 34.285″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Joven	48	16	23.77	228	13	21.81	3.9927314	6.111
Ceres	138	21	43.00	318	20	07.71	3.7611671	3.585
Hughson	217	35	48.50	37	37	26.18	3.8089621	4.002
Turlock	314	57	21.56	134	59	54.45	3.9401931	5.414

KERN, STANISLAUS COUNTY, CAL.

On high foothill 6 miles northwest of Patterson. It can be reached by following road north from Patterson 2 miles, or just south of Vanormer oil station, where road turns due west about 4 miles to base of foothill.

Station mark: A redwood post 4 by 4 inches square, 14 feet high, with cross targets and placed in the ground 3 feet.

Reference mark: A bronze triangulation tablet set in a rock 4 feet northeast of signal.

True azimuth, station to reference mark, 221° 45′.

[Latitude 37° 29′ 41.93S″. Longitude 121° 13′ 42.745″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Oso	96	21	12.28	276	15	54.47	4.11062010	8.016
Moy	137	03	10.37	316	57	38.81	4.29174290	12.164
Tracy	148	31	08.66	328	24	15.23	4.50181990	19.732
Vernalis	161	50	59.57	341	49	00.54	4.18666520	9.550
Windmill	175	31	52.56	355	31	29.44	4.07704600	7.420
Ball	179	20	22.88	359	20	14.90	4.44343980	17.250
Mill	187	12	24.50	7	13	44.02	4.40544210	15.805
Patrick	195	41	09.43	15	43	20.91	4.29101970	12.144
Ripon	198	48	48.45	18	52	38.82	4.45720400	17.805
Jackson	201	40	19.05	21	43	51.83	4.36440070	14.380
Westley	205	19	11.11	25	20	16.06	3.78868921	3.804
Salida	207	56	39.21	28	01	54.79	4.43189970	16.798
Grayson	210	05	51.11	30	07	40.30	3.94312900	5.451
Butler	211	34	25.35	31	38	28.36	4.27101370	11.597
Ranch (2)	220	22	02.84	40	25	38.20	4.12673640	8.319
Theobald (1)	220	19	42.38	40	25	23.43	4.32614940	13.167
Young	223	51	36.36	43	56	41.34	4.24827950	11.006
Modesto	231	57	14.93	52	05	57.93	4.42656770	16.593
Courtney	238	36	40.92	58	43	43.43	4.29947340	12.383
Westport	250	03	27.19	70	10	42.66	4.27112720	11.600
School (Haight)	264	18	37.36	84	20	32.03	3.66745770	2.889
Van Ormer	265	37	37.09	85	40	33.25	3.85304340	4.430
Turlock	269	42	41.20	89	56	53.05	4.53627900	21.361
Joven	270	43	02.08	90	51	39.27	4.31962530	12.971
Patterson	286	45	09.42	106	48	40.19	3.94881640	5.523
Crows Landing	309	42	39.70	129	48	19.60	4.25228540	11.108
Crow	334	43	24.32	154	46	22.64	4.22816350	10.508
Black Gulch	355	51	51.50	175	52	00.32	3.69384970	3.070

LEVISON, STANISLAUS COUNTY, CAL.

A 5 by 5 inch redwood post, with cross targets, on north-south fence line, 300 feet south of county road which runs east from Claus. On land owned by Mr. Levison, which is rented to Mr. G. W. Litt.

Station mark: An iron bench-mark post set at foot of wood post.

[Latitude 37° 40′ 54.208″. Longitude 120° 49′ 45.165″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Hughson	18	40	02.18	198	38	43.46	3.9948177	6.140
Empire	54	18	13.69	234	15	33.63	3.8981668	4.915
Modesto	73	13	54.16	253	07	59.91	4.1716075	9.225
Riverbank	121	14	44.39	301	10	47.17	4.0456656	6.903
Crane	145	23	12.05	325	21	19.88	3.8978509	4.911
Windmill	221	29	42.22	41	32	04.99	3.9357975	5.360
Cashman	231	47	45.15	51	52	47.23	4.1868793	9.555
Walters	243	52	15.77	63	56	30.78	4.0558776	7.067
Hagen	297	08	40.68	117	13	50.24	4.1450398	8.677
Waterford	304	40	12.44	124	42	46.12	3.8748880	4.658
Hall	320	52	30.80	140	56	08.69	4.1422234	8.621

LICK, SANTA CLARA COUNTY, CAL.

Station mark is center of the large observatory on Mount Hamilton. Not the observatory located by the United States Coast and Geodetic Survey.

[Latitude 37° 20′ 29.242″. Longitude 121° 38′ 32.191″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Murphy	6	15	54.10	186	14	48.25	4.3912199	15.296
Loma Prieta	35	01	18.61	214	54	00.48	4.4935714	19.361
Mocho	206	59	03.95	27	02	14.35	4.2297124	10.545
Gerber	275	39	09.52	95	47	41.42	4.3198304	12.977
Madrone	320	54	29.82	140	59	10.36	4.2579461	11.254
Santa Ana	322	55	43.55	143	10	33.43	4.7821472	37.627
Batcher	325	53	09.81	146	00	42.20	4.5176506	20.465
Corral	335	36	50.95	155	41	29.67	4.4401055	17.118
Gavilan	350	26	53.84	170	31	19.45	4.8188815	40.946
Thompson	356	36	10.30	176	37	08.40	4.6038834	24.959

LILLIAN, SANTA CRUZ COUNTY, CAL. (Not occupied.)

Station mark: A flag on hill about 7 miles northwest of Watsonville, Cal.

[Latitude 36° 58′ 34.782″. Longitude 121° 51′ 18.315″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Pajaro	319	54	40.39	139	58	20.21	4.1483064	8.743
Bartlett	347	13	55.96	157	14	50.16	4.0046368	6.280

LOMA PRIETA, SANTA CLARA AND SANTA CRUZ COUNTIES, CAL.

This station of the Coast and Geodetic Survey was formerly known as Mount Bache, and is on the highest peak of the range of mountains forming the boundary line between the counties of Santa Clara and Santa Cruz. It may be reached from Wrights on the Southern Pacific by a wagon road for about 4 miles to D. H. Montgomery's ranch, and then by a fair trail for about 6 or 7 miles to the top of the mountain. The underground mark was a 2 by 3 inch brown stone with a copper bolt in the center, 3 feet 2 inches below the surface. A rock with drill hole filled with lead, having cross lines on the top, was placed 24⅜ inches below the surface and three-eighths inch west of the copper bolt in the brown stone. A concrete foundation 3½ feet square and 9 inches deep was laid around this stone, and upon it was built a hexagonal pier 30 inches in diameter at the base and 26 inches at the top. An 8 by ½ inch copper bolt in top of pier marked the center.

[Latitude 37° 06′ 40.912″. Longitude 121° 50′ 36.423″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Mocho	212	04	03.95	32	14	32.67	4.6814337	29.839
Lick	214	54	00.48	35	01	18.61	4.4935714	19.361
Gerber	238	37	53.85	58	53	42.45	4.6553767	28.101
Madrone	248	31	05.58	68	43	02.86	4.4977960	19.550
Murphy	265	56	07.85	86	02	19.19	4.1827286	9.464
Corral	269	02	45.00	89	14	39.97	4.4662553	18.180
Batcher	272	38	09.52	92	52	57.61	4.5610335	22.614
Pacheco	282	52	32.40	103	12	39.46	4.7058346	32.299
Santa Ana	292	37	25.88	112	59	29.33	4.7706278	36.642
Gilroy	293	29	39.81	113	39	26.77	4.4191614	16.312
Thompson	305	37	10.10	125	45	24.37	4.3972921	15.511
Madonna	311	11	35.22	131	16	39.15	4.2192995	10.296
Lux	310	59	06.23	131	10	08.26	4.5610335	22.614
Gavilan	323	44	45.39	143	56	25.47	4.6890356	30.366
Pajaro	342	41	38.92	162	44	53.88	4.4309190	16.760
Bartlett	357	14	34.56	177	15	03.64	4.3957141	15.455

LUX, SANTA CLARA COUNTY, CAL.

On western knob of bald hill, 1½ miles southwest of Sargent, a station on the Southern Pacific (Coast Line) Railroad. Station may be reached on horseback from any direction.

Station mark and signal: An oak tree 11 feet high, placed in the ground a depth of 3 feet.

Reference mark: A bronze triangulation tablet set in rock, 4 feet northwest of signal and station mark.

True azimuth, station to reference mark, 126° 27′.

]Latitude 36° 53′ 51.907″. Longitude 121° 32′ 16.454″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Bartlett	87	35	08.75	267	24	37.45	4.4160516	16.196
Watsonville	95	31	10.30	275	23	08.83	4.2997344	12.390
Loma Prieta	131	10	08.26	310	59	06.23	4.5610335	22.614
Thompson	142	55	01.60	322	52	13.63	4.0593523	7.124
Gilroy	166	43	22.42	346	42	06.63	4.1325515	8.431
Corral	184	57	59.01	4	58	50.16	4.3844156	15.058
Batcher	202	42	52.69	22	46	36.68	4.3766676	14.792
Pacheco	241	12	15.89	61	21	18.72	4.4061085	15.829
Santa Ana	268	07	33.07	88	18	32.78	4.4348091	16.911
Gavilan	354	08	46.82	174	09	25.86	4.1995939	9.839

MADONNA, SANTA CLARA COUNTY, CAL. (Not occupied.)

Station mark: A very prominent tree on Madonna Hill, about 7 miles west of Gilroy.

[Latitude 37° 00′ 46.622″. Longitude 121° 42′ 12.086″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Loma Prieta	131	16	39.15	311	11	35.22	4.2192995	10.296
Murphy	192	53	04.54	12	54	11.49	4.0898192	7.641
Corral	235	54	15.52	56	01	05.73	4.3073100	12.608
Thompson	294	56	54.69	115	00	04.93	3.9356804	5.358

MADRONE, SANTA CLARA COUNTY, CAL.

Station is on highest point of a ridge known as the Blue Ridge, lying between the main fork and the east fork of Coyote Creek. It is about 5 miles northeast of Madrone Springs, a small summer resort on Soda Springs Creek, a tributary of Coyote Creek from the west. It can be reached on horseback from almost any direction, but probably best from Madrone Springs.

Signal and station mark: A pine tree trimmed up with the top left on it.

Reference mark: Bronze triangulation tablet set in rock on summit of hill, the signal is 223.9 feet north-northwest of tablet. Highest point has scattering trees on it.

[Latitude 37° 12′ 53.015″; longitude 121° 30′ 49.015″. Tablet on summit: Latitude 37° 12′ 51.088; longitude 121° 30′ 47.654″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Corral	00	18	56.76	180	18	55.27	4.0427551	6.857
Thompson	19	13	18.82	199	09	37.48	4.4403645	17.128
Loma Prieta	68	43	02.86	248	31	05.58	4.4977960	19.550
Lick	140	59	10.36	320	54	29.82	4.2579461	11.254
Mocho	172	48	49.52	352	47	18.67	4.4685892	18.278
Red	192	24	21.71	12	26	19.71	4.3479766	13.846
Gerber	218	02	31.51	38	06	22.19	4.1824226	9.457
Orestimba	244	34	00.89	64	44	29.85	4.4520375	17.595
Castle	270	06	35.17	90	14	41.74	4.2974719	12.326
Howard	281	54	53.74	102	05	34.46	4.4269767	16.609
Pacheco	318	39	02.78	138	47	14.84	4.4845820	18.964
Batcher	331	59	16.73	152	02	08.73	4.1753466	9.305

MILL, SAN JOAQUIN COUNTY, CAL.

A wooden windmill with 14-foot wheel, on ranch owned by W. C. Miller, about 4 miles southwest of Ripon, on the Southern Pacific Railroad.

Station mark: Center of windmill tower.

[Latitude 37° 43′ 20.438″. Longitude 121° 11′ 32.452″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Kern	7	13	44.02	187	12	24.50	4.4054421	15.805
Vernalis	36	54	50.91	216	51	31.94	4.1235570	8.259
Moy	56	36	29.35	236	29	37.30	4.2967110	12.304
Bell	125	44	37.02	305	43	09.28	3.6359280	2.687
Ripon	252	40	35.90	72	43	07.12	3.8019704	3.938

MOCHO, ALAMEDA OR SANTA CLARA COUNTY, CAL.

A station of the Coast and Geodetic Survey.

On the summit of the highest peak of the group of mountains lying to the eastward of Santa Clara Valley, on the eastern flank of the Mount Diablo Range and overlooking the San Joaquin Valley; about 11½ miles northeast from the Lick Observatory on Mount Hamilton and about 30 miles southeast of the town of Livermore. The station was marked in 1879 by a copper bolt sunk in the rock, over which, in 1887, was built a concrete pier 45 inches high by 24 inches square, enlarged to the top to 26 inches, to receive the theodolite.

Since the above description was written another concrete pier has been built about 5 feet east of the station and a small house built over the two piers. The crooked tree at this station was sighted from stations "Red" and "Gerber," but from all other stations a signal over center was sighted.

[Latitude 37° 28′ 39.696″. Longitude 121° 33′ 18.781″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Lick	27	02	14.35	206	59	03.95	4.2297124	10.545
Loma Prieta	32	14	32.67	212	04	03.95	4.6814337	29.839
Brown	158	16	46.61	338	14	25.24	4.1868513	9.554
Oso	258	12	43.76	78	19	21.82	4.2150722	10.196
Orestimba	300	10	25.93	120	22	27.75	4.5295001	21.031
Red	311	12	47.99	131	16	17.40	4.0515329	6.997
Gerber	322	45	51.99	142	51	14.33	4.3343459	13.418
Pacheco	335	22	57.78	155	32	41.97	4.7581030	35.600
Santa Ana	335	38	02.09	155	49	43.91	4.8430541	43.292
Batcher	345	47	49.34	165	52	12.58	4.6408546	27.177
Madrone	352	47	18.67	172	48	49.52	4.4685892	18.278

MODESTO, STANISLAUS COUNTY, CAL.

High city water tank in Modesto.
Station mark: Center of water tank.

[Latitude 37° 38′ 34.886″. Longitude 120° 59′ 24.970″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Joven	0	40	49.15	180	40	44.22	4.2232140	10.389
Westport	19	10	25.15	199	08	58.02	4.0282731	6.632
Orestimba	30	27	52.41	210	19	17.95	4.6133547	25.510
Courtney	33	36	39.86	213	34	59.53	3.8624533	4.527
Black Gulch	44	10	28.63	224	01	54.73	4.4734037	18.482
Kern	52	05	57.93	231	57	14.93	4.4265677	16.593
Oso	66	12	16.86	245	58	15.44	4.5686249	23.014
Young	67	19	03.96	247	15	25.78	3.9777505	5.903
Moy (2)	86	36	12.94	266	21	57.06	4.5369794	21.396
Vernalis (1)	86	02	30.84	265	51	47.83	4.4130241	16.083
Butler	87	19	09.20	267	14	28.77	4.0519460	7.003
Theobald	87	46	43.81	267	43	41.58	3.8646070	4.549
Patrick	98	40	01.64	278	33	29.34	4.2019739	9.893
Salida	131	44	53.28	311	41	25.11	4.0485074	6.948
Stack	182	30	44.10	2	30	53.39	3.9291913	5.279
Riverbank	205	03	22.06	25	05	19.41	4.0452347	6.896
Oakdale	215	00	24.57	35	05	20.49	4.3144711	12.818
Crane	221	56	03.58	42	00	05.95	4.1620978	9.025
Claus	232	36	55.50	52	39	33.91	3.9027590	4.967
Walters	249	04	27.35	69	14	36.69	4.4171911	16.238
Levison	253	07	59.91	73	13	54.16	4.1716075	9.225
Empire	272	20	35.48	92	23	49.57	3.8919838	4.845
Hagen	274	23	00.81	94	34	04.27	4.4268888	16.605
Hughson	294	34	51.25	114	39	26.48	4.0850366	7.558
Turlock	320	48	12.87	140	53	43.16	4.3233657	13.083
Ceres	330	37	09.32	150	38	31.37	3.8275030	4.177

MONTPELIER, STANISLAUS COUNTY, CAL. (Not occupied.)

A windmill located by the public school in Montpelier, a station on the Santa Fe Railway. It can not be seen from Dallas.
Station mark: Center of windmill tower.

[Latitude 37° 32′ 57.499″. Longitude 120° 42′ 24.568″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Turlock	63	16	59.24	243	12	07.68	4.1194054	8.180
Hughson	110	56	25.64	290	50	38.36	4.1749079	9.295
Hall	152	23	08.60	332	22	17.53	3.6467811	2.755
Hagen	191	02	18.25	11	02	58.60	3.9280379	5.265
Pillsbury	252	35	14.75	72	40	29.59	4.1231511	8.251
Bloodsoe	292	49	43.77	112	53	39.21	4.0127644	6.399

MOY, SAN JOAQUIN COUNTY, CAL.

On fence line on top of small hill 7.5 miles south of Banta. It is about 300 feet west of road, on land owned by Peter Moy.
Station mark: Iron bench-mark post.

[Latitude 37° 37′ 26.404″. Longitude 121° 22′ 46.659″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Black Butte	110	32	26.50	290	28	50.91	3.9657369	5.742
Western Pacific tank	160	23	23.00	340	22	02.00	3.9295800	5.284
Banta	181	59	03.00	1	59	45.00	4.1534900	8.848
Red barn	195	15	32.00	15	17	02.00	4.1391300	8.560
Fitzsimmons	201	49	59.79	21	51	46.62	4.0611109	7.153
Manteca	216	19	24.16	36	25	26.60	4.3886584	15.206
Hinkle	232	37	01.00	52	39	31.00	3.8809600	4.724
Tracy	163	37	38.51	345	36	16.95	4.1192620	8.177
Bell	234	01	00.34	44	06	24.85	4.2719258	11.622
Mill	236	29	37.30	56	36	29.35	4.2967110	12.304
Ripon	240	22	11.34	60	31	34.53	4.4141724	16.126
Salina	249	44	26.60	69	55	15.01	4.4425550	17.215
Patrick	256	21	43.77	76	29	27.64	4.2822830	11.902
Modesto	266	21	57.06	86	36	12.94	4.5369794	21.396
Vernalis	268	03	55.97	88	07	28.82	3.9322097	5.316
Windwill	280	58	00.57	101	03	09.38	4.1018339	7.856
Westport	284	21	46.00	104	34	33.88	4.5037590	19.820
Kern	316	57	38.81	137	03	10.37	4.2917429	12.164
Oso	357	36	55.94	177	37	09.27	4.1110144	8.024

MURPHY, SANTA CLARA COUNTY, CAL.

On the highest point of a high hill about 1 mile west of Morgan Hill, a small town on the Southern Pacific Co.'s Coast Line. Animals can be ridden to summit.

Station mark and signal: A small tree left standing; other trees and brush were cut from the summit.

Reference mark: A bronze triangulation tablet set on large rock.

At this station, signal and mark are on same azimuth from position of instrument, the signal being 5.7 feet from instrument and mark 15 feet from instrument. True azimuth, station to reference mark, 247° 17′.

[Latitude 37° 07′ 15.489″. Longitude 121° 40′ 21.006″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Madonna	12	54	11.49	192	53	04.54	4.0898192	7.641
Loma Prieta	86	02	10.19	265	56	07.85	4.1827286	9.464
Lick	186	14	48.25	6	15	54.10	4.3912199	15.296
Corral	272	30	54.59	92	36	38.28	4.1484306	8.745
Pacheco	289	57	46.35	110	11	42.64	4.5622606	22.678
Gilroy	322	31	40.94	142	35	17.03	4.1633691	9.051
Thompson	342	01	11.94	162	03	15.49	4.2156193	10.209

MOUNT OSO, STANISLAUS COUNTY, CAL.

On summit of Mount Oso, 17 miles south of Tracy and 10 miles southwest of Westley. Can be reached from Westley by following due west road, 1 miles north of town about 4 miles, where road turns due south past Mr. G. W. Hamilton's ranch house, to mouth of Ingram Creek Canyon. Road can be followed up canyon about 6 miles from Hamilton's. At forks of creek, at sheep camp, take the right-hand road up a grade. The road stops at an old lone chimney. Ridge south of creek can be followed on horseback about 2 miles to summit.

It can also be reached from the west side by following road up Hospital Creek canyon, about 19 miles from Vernalis or 2 miles beyond Sperry's ranch, then climb to top.

Station mark and signal: Pine tree about 12 feet high, placed in the ground and braced with four poles.

Reference mark: A bronze triangulation tablet set in rock 5.7 feet southeast of signal.

True azimuth, station to reference mark, 311° 44′.

[Latitude 37° 30′ 27.925″. Longitude 121° 22′ 24.785″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Gerber	8	24	24.45	188	23	09.54	4.3172692	12.901
Red	35	17	24.37	215	14	16.09	4.1198399	8.188
Mocho	78	19	21.82	258	12	43.76	4.2150722	10.196
Brown	116	47	36.87	296	38	36.81	4.3864221	15.128
Tracy	171	34	04.87	351	32	30.07	4.4138071	16.112
Moy	177	37	09.27	357	36	55.94	4.1110144	8.024
Vernalis	211	16	52.58	31	20	11.82	4.1884572	9.590
Windmill	228	31	44.00	48	36	39.08	4.1999876	9.848
Modesto	245	58	15.44	66	12	16.86	4.5686429	23.014
Ranch	247	42	25.53	67	51	19.06	4.3657573	14.425
Grayson	250	13	22.11	70	20	29.37	4.2622189	11.365
Westley	255	01	06.76	75	07	29.71	4.2034832	9.927
Westport	260	40	23.66	80	52	57.21	4.4881356	19.120
Turlock	271	26	03.08	91	45	32.87	4.6740870	29.338
Kern	276	15	54.47	96	21	12.28	4.1106201	8.016
Patterson	280	30	16.72	100	39	05.24	4.3365104	13.485
Black Gulch	295	39	40.03	115	45	06.50	4.1652690	9.091
Orestimba	327	09	52.67	147	15	17.38	4.3849974	15.078

NEWMAN, STANISLAUS COUNTY, CAL. (Not occupied.)

Station mark: Center of a large black steel water tank in Newman, a town on the Southern Pacific Railroad.

[Latitude 37° 18′ 52.506″. Longitude 121° 01′ 27.013″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Christian	24	43	50.78	204	41	18.77	4.1704023	9.199
Cleveland	62	07	36.52	242	03	43.93	4.0293702	6.648
Orestimba	93	24	02.38	273	16	43.84	4.2514212	11.086
Crow	113	30	01.38	293	25	33.12	4.0744560	7.376
Black Gulch	130	26	41.98	310	19	24.09	4.3672457	14.474

NO. 1, STANISLAUS COUNTY, CAL.

A lumber tripod on pasture hill north of road which runs from Waterford to La Grange. Signal can not be seen from road. Turn north across canal at white house on south side of road about 8 miles east of Waterford.

Station mark: An iron bench-mark post under center of tripod.

[Latitude 37° 39′ 34.627″. Longitude 120° 36′ 25.540″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Hagen	61	20	54.88	241	17	56.02	3.9129691	5.085
Walters	128	31	34.80	308	27	40.82	4.0784010	7.443
Cashman	147	56	52.65	327	53	45.51	4.1494960	8.767
Wolfling	171	27	44.54	351	27	13.84	3.9180228	5.145
Russian	251	47	36.34	71	49	50.17	3.7520325	3.511
Holmes	304	17	16.02	124	21	19.39	4.0731554	7.354
Pillsbury	334	59	41.74	155	01	17.81	3.9606918	5.676
School	353	00	50.99	173	01	27.47	4.0815762	7.498

OAKDALE, STANISLAUS COUNTY, CAL.

A lumber tripod on top of hill 2 miles north of Oakdale and three-quarters of a mile northeast of Burnetts station.

Station mark: A bench-mark post under center of tripod.

[Latitude 37° 47′ 42.664″. Longitude 120° 51′ 21.278″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Crane	19	20	09.91	199	19	16.46	3.8097394	4.010
Modesto	35	05	20.49	215	00	24.57	4.3144711	12.818
Riverbank	46	16	28.69	226	13	30.01	3.9950055	6.143
Cashman	282	02	20.13	102	08	21.47	4.1691066	9.172
Walters	301	06	18.92	121	11	33.11	4.1665594	9.118
Oakdale Church	350	23	47.52	170	24	01.48	3.5241722	2.077

OAKDALE CHURCH, STANISLAUS COUNTY, CAL. (Not occupied.)

Methodist Episcopal Church in Oakdale, a town on the Southern Pacific Railroad.

Station mark: Center of spire.

[Latitude 37° 45′ 55.743″. Longitude 120° 50′ 58.490″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Riverbank	65	20	22.93	245	17	10.36	3.9281348	5.266
Oakdale	170	24	01.48	350	23	47.52	3.5241722	2.077
Cashman	269	06	18.83	89	12	06.09	4.1423894	8.625

ORESTIMBA, STANISLAUS COUNTY, CAL.

On highest point of mountain 11 miles due west of Newman, and north of Orestimba Creek; it can be reached from Orestimba School, 6 miles west of Newman, by following road up creek 3 miles to gate where road turns due north uphill. Follow road 2 miles to Stonesifer's cabin, thence by trail up creek half a mile, then follow up ridge on the south to station, about 2 miles.

Station mark and signal: An oak tree 11 feet high placed in the ground 3 feet.

Reference mark: A bronze triangulation tablet set in rock 3.9 feet south of signal.

True azimuth, station to reference mark, 348° 59′.

[Latitude 37° 19′ 26.221″. Longitude 121° 13′ 30.373″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Castle	25	21	22.13	205	19	00.35	4.1296786	8.376
Batcher	36	19	15.29	216	11	39.40	4.4973537	19.530
Madrone	64	44	29.85	244	34	00.89	4.4520375	17.595
Gerber	89	33	35.28	269	26	56.51	4.2093470	10.062
Red	114	58	14.86	294	49	42.62	4.3597532	14.227
Mocho	120	22	27.75	300	10	25.93	4.5295001	21.031
Oso	147	15	17.38	327	09	52.67	4.3849974	15.078
Black Gulch	180	12	47.35	0	12	48.64	4.1477756	8.732
Van Ormer	199	12	49.78	19	15	38.21	4.3154824	12.848
Patterson	206	33	27.39	26	36	50.23	4.2637837	11.406
Modesto	210	19	17.95	30	27	52.41	4.6133547	25.510
Westport	214	13	47.10	34	20	54.20	4.4865596	19.051
Joven	227	41	44.76	47	50	13.43	4.4442363	17.282
Turlock	240	39	32.06	60	53	34.74	4.5920418	24.288
Crow	241	55	14.85	61	58	05.31	3.8942543	4.871
Newman	273	16	43.84	93	24	02.38	4.2514212	11.086
Gustine	291	13	58.38	111	22	06.63	4.3285122	13.239
Stacks	300	19	10.25	120	28	06.57	4.4031347	15.721
Cleveland	305	50	47.80	125	54	13.50	4.0136237	6.412
Christian	321	11	24.08	141	16	09.99	4.2691191	11.547
Howard	358	17	36.76	178	17	49.68	4.2476912	10.991

PACHECO, SANTA CLARA COUNTY, CAL.

Sharp rock, the highest point of rocky summit of mountain in Santa Clara County, known as Pacheco Peak. The summit has been cleared of laurel trees, but one was left standing about 30 feet northeast of rock used as signal. Peak is about 3 miles southeast of Bell station, a well-known stopping place on Pacheco Pass road, and is most easily reached from this place on horseback.

Signal: Sharp rock, the highest point of summit.

Station mark: A bronze triangulation tablet set in top of rock used as signal.

[Latitude 37° 00′ 29.018″. Longitude 121° 17′ 13.483″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Gavilan	36	36	59.77	216	28	36.92	4.5421347	21.651
Lux	61	21	18.72	241	12	15.89	4.4061085	15.829
Thompson	84	03	00.87	263	51	09.33	4.4684031	18.271
Loma Prieta	103	12	39.46	282	52	32.40	4.7058346	32.299
Murphy	110	11	42.64	289	57	46.35	4.5622606	22.678
Corral	120	33	39.86	300	25	26.87	4.3702019	14.573
Batcher	126	34	01.70	306	28	41.90	4.2126976	10.140
Madrone	138	47	14.84	318	39	02.78	4.4845820	18.964
Mocho	155	32	41.97	335	22	57.78	4.7581030	35.600
Gerber	162	57	56.42	342	53	33.88	4.5626024	22.696
Castle	179	19	12.14	359	19	05.49	4.3593694	14.214
Howard	199	08	24.71	19	10	52.12	4.2647058	11.430
Bareillas	264	46	49.16	84	55	47.40	4.3461620	13.788
Santa Ana	336	57	30.96	156	59	28.64	4.0927644	7.693

PAJARO, SANTA CRUZ COUNTY, CAL.

Station is on a small hill one-fourth mile north of Pajaro and Castorville road and about a mile a little west of south of Pajaro Railroad station. It can be reached in a buggy.

Signal and station mark: An eucalyptus tree about 12 feet above ground and 4 feet or more in the ground.

Reference mark: A United States Geological Survey bronze triangulation tablet set in granite rock which was set in ground at base of tree.

[Latitude 36° 52′ 45.422″. Longitude 121° 45′ 12.438″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Bartlett	97	37	45.61	277	35	00.16	3.8380452	4.280
Lillian	139	58	20.21	319	54	40.39	4.1483064	8.743
Loma Prieta	162	44	53.88	342	41	38.92	4.4309190	16.760
Watsonville	170	47	22.36	350	47	06.85	3.6016018	2.483
Church	189	05	02.29	9	05	29.07	3.8443243	4.342
School	222	30	58.03	42	32	53 32	3.8470803	4.369
Gavilan	303	14	48.39	123	23	12.42	4.3970080	15.501

PATRICK, STANISLAUS COUNTY, CAL.

An old wooden windmill, near a cedar tree on Mr. Fitzpatrick's land, 6 or 7 miles southwest of Salida. The tower of the windmill has been wrapped with white cloth.

Station mark: Center of windmill tower.

[Latitude 37° 39′ 52.222″. Longitude 121° 10′ 07.150″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Kern	15	43	20.91	195	41	09.43	4.2910197	12.144
Vernalis	67	20	41.04	247	16	30.11	4.0380988	6.783
Moy	76	29	27.64	256	21	43.77	4.2822830	11.902
Jackson	230	31	44.96	50	33	06.38	3.6261328	2.627
Salida	235	35	20.50	55	38	24.90	3.9520277	5.564
Modesto	278	33	29.34	98	40	01.64	4.2019739	9.893
Butler	303	02	14.68	123	04	06.47	3.7285138	3.326

PATTERSON, STANISLAUS COUNTY, CAL. (Not occupied.)

Station mark: Center of a large steel water tank in town of Patterson, on the Southern Pacific Railroad.

[Latitude 37° 28′ 18.694″. Longitude 121° 07′ 56.380″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Crow	5	50	46.97	185	50	14.80	4.1070391	7.950
Orestimba	26	36	50.23	206	33	27.39	4.2637837	11.406
Black Gulch	73	52	30.56	253	49	08.71	3.9289646	5.726
Oso	100	39	05.24	280	30	16.72	4.3365104	13.485
Kern	106	48	40.19	286	45	09.42	3.9488164	5.523

PILLSBURY, STANISLAUS COUNTY, CAL.

A lumber tripod on hill on H. D. Pillsbury's land, about 12 miles east of Hickman, and 1 or 2 miles southwest of Alfred Davis's place.

Station mark: An iron bench-mark post set under center of tripod.

[Latitude 37° 35′ 06.076″. Longitude 120° 33′ 48.167″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Bloodsoe	21	49	55.12	201	48	35.94	3.9334675	5.331
School (Dickinson)	32	56	18.86	212	55	19.36	3.6439801	2.737
Dallas	37	34	21.51	237	27	50.42	4.2713761	11.607
Montpelier	72	40	29.59	252	35	14.75	4.1231511	8.251
Hagen	111	32	46.36	291	28	11.62	4.0744735	7.376
No. 1	155	01	17.81	334	59	41.74	3.9606918	5.676
Wolfling	162	50	54.25	342	48	47.43	4.2364223	10.710
Russian	188	33	10.51	8	33	48.14	4.0067203	6.311
Holmes	254	47	31.13	74	49	58.29	3.7876239	3.810
Thomsen	318	32	42.59	138	34	54.25	3.9036801	4.978

RANCH, STANISLAUS COUNTY, CAL. (Not occupied.)

Station mark: Center of cupola on residence near the junction of San Joaquin and Tuolumne rivers.

[Latitude 37° 35′ 12.675″. Longitude 121° 07′ 49.301″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Kern	40	25	38.20	220	22	02.84	4.1267364	8.319
Oso	67	51	19.06	247	42	25.53	4.3657673	14.425

RED MOUNTAIN, STANISLAUS COUNTY, CAL.

A well-known mountain at the north end of San Antonio Valley. It is on the second summit from the south end of mountain and about 1 mile northeast of magnesite mine, which is reached by good road from Livermore (30 or 40 miles). San Antonio Valley can also be reached by road from Lick Observatory, but the road is not very good for a heavy load. There is no road to the San Joaquin Valley. No forage can be obtained at the mine but there is good water. Can be reached on horseback from mine. Camp can be located for a reasonable time at Mr. Gerber's ranch, 4 miles south, but he has no hay to sell in large quantities.

Signal: A pine tree with lower limbs cut off, about 25 feet high.

Station mark: A triangulation tablet set in rock at foot of tree.

Position of instrument was changed to see Orestimba, as signal is not quite on highest point of mountain.

[Latitude 37° 24′ 38.914″. Longitude 121° 27′ 34,351″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Madrone	12	26	19.11	192	24	21.71	4.3479766	13.846
Mocho	131	16	17.40	311	12	47.99	4.0515329	6.997
Oso	215	14	16.09	35	17	24.37	4.1198399	8.188
Black Gulch	257	57	01.93	78	05	36.20	4.3276709	13.214
Orestimba	294	49	42.62	114	58	14.86	4.3597532	14.227
Gerber	334	52	18.76	154	54	11.81	4.0334548	6.711

RIPON, SAN JOAQUIN COUNTY, CAL. (Not occupied.)

A light-colored tank house with green roof, in town of Ripon, a station on the Southern Pacific Railroad.

[Latitude 37° 44′ 21.582″. Longitude 121° 07′ 25.326″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Kern	18	52	38.82	198	48	48.45	4.4572040	17.805
Moy	60	31	34.53	240	22	11.34	4.4141724	16.126
Mill	72	43	07.12	252	40	35.90	3.8019704	3.938
Bell	93	51	53.45	273	47	54.43	3.9814538	5.954
Salida	313	28	54.44	133	30	19.96	3.6737816	2.932

RIVERBANK, STANISLAUS AND SAN JOAQUIN COUNTIES, CAL.

A high white tank in Riverbank, a town on the Santa Fe Railway. The tank belongs to the Riverbank Water Co.

Station mark, center of tank.

[Latitude 37° 44′ 00.933″. Longitude 120° 56′ 13.029″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Modesto	25	05	19.41	205	03	22.06	4.0452347	6.896
Stack	70	08	21.29	250	06	33.14	3.6629653	2.860
Salida	78	43	29.55	258	38	03.74	4.1238703	8.265
Oakdale	226	13	30.01	46	16	28.69	3.9950055	6.143
Oakdale Church	245	17	10.36	65	20	22.93	3.9281348	5.266
Cashman	260	04	53.32	80	13	53.03	4.3405264	13.611
Crane	261	29	45.28	81	31	50.43	3.7043614	3.146
Walters	272	07	25.81	92	15	38.32	4.2949653	12.255
Levison	301	10	47.17	121	14	44.39	4.0456656	6.903
Claus	342	24	32.45	162	25	13.61	3.7368615	3.390
Empire	343	26	07.39	163	27	24.33	4.0343524	6.725

RUSSIAN, STANISLAUS COUNTY, CAL.

A 6 by 6 inch post with cross targets, on pasture hill owned by Mr. Rushing, about 6 miles from La Grange, which is nearest stopping place. Cross iron bridge about 2 miles from town and take road that turns to right up hill by bridge. Follow on north side of canal and take road that turns to right.

Signal and station mark: The 6-inch post.

Reference mark: A triangulation tablet set in rock.

True azimuth, station to reference mark, 72° 45′, distance, 2.7 feet.

[Latitude 37° 40′ 31.829″. Longitude 120° 32′ 46.531″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Pillsbury	8	33	48.14	188	33	10.51	4.0067203	6.311
No. 1	71	49	50.17	251	47	36.34	3.7520325	3.511
Wolfling	134	16	28.39	314	13	43.74	3.9641017	5.721
Holmes	332	25	20.57	152	27	10.24	3.9784706	5.913

SALIDA, STANISLAUS COUNTY, CAL.

A flagpole on the Salida Grain Co.'s warehouse at Salida, a station on the Southern Pacific Railroad. There is a platform at the base of the pole which can be occupied.

Station mark: Center of flagpole.

[Latitude 37° 42′ 36.249″. Longitude 121° 05′ 05.558″.]

To station—	Azimuth.			Black azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Kern	28	01	54.79	207	56	39.21	4.4318997	16.798
Patrick	55	38	24.90	235	35	20.50	3.9520277	5.564
Jackson	60	08	09.08	240	06	26.11	3.6773654	2.956
Vernalis	62	06	02.43	241	58	47.06	4.2959553	12.283
Moy	69	55	15.01	249	44	26.60	4.4425550	17.215
Ripon	133	30	19.96	313	28	54.44	3.6737816	2.932
Riverbank	258	38	03.74	78	43	29.55	4.1238703	8.265
Stack	263	07	26.60	83	11	04.24	3,9433400	5.454
Modesto	311	41	25.11	131	44	53.28	4.0485074	6.948
Theobald	352	22	42.56	172	23	08.35	3.8919282	4.845

SANTA ANA, SAN BENITO COUNTY, CAL.

A station of the Coast and Geodetic Survey.

On western summit of a double-topped peak, very rocky and covered with oaks, locally known as Henrietta Peak, about 2 miles from the one known as Santa Ana. The station is easily reached from the town of Hollister by going out the main street to the north, crossing the railroad track, and taking the first road to the right or east. Follow this road for about 2 miles to a road running north and south, turn to the north and proceed until a second road leading to the right is reached; take this and proceed easterly, following the main wagon road and crossing the creek at the mouth of the Dos Picachos Canyon. By following the grade which winds up the ridge on the north side of the Dos Picachos Canyon for about 6 or 8 miles a point is reached near the summit of the grade, about halfway between Herrington's ranch house and the Stayton mine, where the wagon road should be left and the backbone of the ridge followed in a southwesterly direction until the station is reached, about half a mile south of and 1,000 feet above Herrington's house.

Station was marked by an irregular-shaped rock with a copper bolt in the top, around which a concrete foundation 3 feet square and about 10 inches deep was laid, and upon this a concrete pier, hexagonal in shape, and 26 inches in diameter, was built. A copper bolt with cross cut upon it was set in top of pier to mark center of station, 5 feet 2½ inches above the subsurface mark. A concrete pier, occupied in 1885 for latitude observations, was 37 feet 6 inches from the triangulation station in azimuth 129° 07′ 01″.

Instrument was placed over center of mark.

[Latitude 36° 54′ 19.368″. Longitude 121° 13′ 57.739″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Gavilan	57	08	31.24	236	58	11.66	4.4846064	18.965
Lux	88	18	32.78	268	07	33.07	4.4348091	16.911
Thompson	103	47	17.17	283	33	28.84	4.5452822	21.809
Loma Prieta	112	59	29.33	292	37	25.88	4.7706278	36.642
Batcher	139	39	40.49	319	32	23.27	4.4427328	17.222
Lick	143	10	33.43	322	55	43.55	4.7821472	37.627
Mocho	155	49	43.91	335	38	02.09	4.8430541	43.292
Pacheco	156	59	28.64	336	57	30.96	4.0927644	7.693
Howard	182	23	31.76	2	24	01.10	4.4593361	17.893
Bareillas	232	10	14.11	52	17	14.01	4.3394995	13.578

WATSONVILLE SCHOOL, SANTA CRUZ COUNTY, CAL. (Not occupied.)

A school about 3½ miles a little north of east of Watsonville, Cal.
Station mark: Center of cupola.

[Latitude 36° 55′ 33.524″. Longitude 121° 42′ 00.429″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Pajaro	42	32	53.32	222	30	58.03	3.8470803	4.369
Bartlett	69	47	37.62	249	42	56.77	4.0913279	7.668
Gavilan	319	31	36.00	139	38	05.18	4.3945289	15.413

STACKS, MERCED COUNTY, CAL. (Not occupied.)

The northern of two stacks at oil station about 4 miles south-southeast of Gustine, a town on the Southern Pacific Railroad.
Station mark: Center of northern stack.

[Latitude 37° 12′ 30.985″. Longitude 120° 58′ 44.658″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Christian	80	38	10.83	260	34	00.83	4.0143355	6.422
Cleveland	116	41	07.26	296	35	36.71	4.1779102	9.360
Orestimba	120	28	06.57	300	19	10.25	4.4031347	15.721

STACK, STANISLAUS COUNTY, CAL.

Station mark: Center of stack on mill about 3 miles west of Riverbank and 6 miles north of Modesto.

[Latitude 37° 43′ 10.182″. Longitude 120° 59′ 09.765″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Modesto	2	30	53.39	182	30	44.10	3.9291913	5.279
Salida	83	11	04.24	263	07	26.60	3.9433400	5.454
Riverbank	250	06	33.14	70	08	21.29	3.6629653	2.860
Claus	301	17	25.26	121	19	54.51	3.8449099	4.348

THEOBALD, STANISLAUS COUNTY, CAL.

A high red wooden tank on Theobald's ranch (Mrs. Cassius Crow, owner), located 4½ miles west of Modesto on north side of road.
Station mark: Center of tank.

[Latitude 37° 38′ 25.578″. Longitude 121° 04′ 23.379″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Young	23	09	52.92	203	09	16.91	3.5655681	2.285
Kern	40	25	23.43	220	19	42.38	4.3261494	13.167
Butler	86	24	59.53	266	23	21.34	3.5965564	2.454
Salida	172	23	08.35	352	22	42.56	3.8919282	4.845
Modesto	267	43	41.58	87	46	43.81	3.8546070	4.549

THOMSEN, MERCED COUNTY, CAL.

A lumber tripod on Henry Thomsen's place, 6 miles west of Snelling. Follow railroad from Snelling to Hopetown, then turn due west and take first main north and south road. Signal is on a little butte about 2 miles north of house and about one-fourth mile west of road.

Station mark: An iron bench-mark post set under center of tripod.

[Latitude 37° 31′ 51.272″. Longitude 120° 30′ 12.169″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Bloodsoe	77	02	28.17	256	58	57.48	3.9403839	5.417
School	106	42	58.36	286	39	47.29	3.9050916	4.994
Pillsbury	138	34	54.25	318	32	42.59	3.9036801	4.978
Holmes	184	38	55.26	4	39	10.64	3.8829431	4.746

THOMPSON, SANTA CLARA COUNTY, CAL.

Station is on highest point of bald mountain about 2 miles southeast of Gilroy, a town on the Southern Pacific Railroad (Coast Line). The land is owned by the Miller & Lux Co., and can be easily reached on horseback from the California Wine Association's headquarters at the foot of mountain.

Station mark and signal: An oak tree set in ground.

Reference mark: A bronze triangulation tablet cemented in rock 4.4 feet northwest of signal. Instrument placed over tablet.

True azimuth, station to reference mark, 122° 15′.

[Latitude 36° 58′ 48.509″. Longitude 121° 36′ 55.953″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Madonna	115	00	04.93	294	56	54.69	3.9306804	5.358
Loma Prieta	125	45	24.37	305	37	10.10	4.3972921	15.511
Murphy	162	03	15.49	342	01	11.94	4.2156193	10.209
Lick	176	37	08.40	356	36	10.30	4.6038834	24.959
Madrone	199	09	37.48	19	13	18.82	4.4403645	17.128
Corral	210	57	09.38	31	00	48.97	4.2429236	10.871
Gilroy	223	01	41.06	43	03	13.40	3.7449825	3.454
Batcher	231	26	52.85	51	33	25.41	4.3134420	12.788
Pacheco	263	51	09.33	84	03	00.87	4.4684031	18.271
Santa Ana	283	33	28.84	103	47	17.17	4.5452822	21.809
Lux	322	52	13.63	142	55	01.60	4.0593523	7.124
Gavilan	341	02	47.79	161	06	14.56	4.4202423	16.353

TRACY, SAN JOAQUIN COUNTY, CAL.

High red tank in town of Tracy, Cal.

Station mark: Center of tank.

[Latitude 37° 44′ 19.886″. Longitude 121° 25′ 00.077″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Brown	50	40	23.58	230	32	57.01	4.3649212	14.397
Kern	328	24	15.23	148	31	08.66	4.5018199	19.732
Moy	345	36	16.95	165	37	38.51	4.1192620	8.177
Oso	351	32	30.07	171	34	04.87	4.4138071	16.112

TURLOCK, STANISLAUS COUNTY, CAL.

An iron city tank in Turlock. It is east and north of twin tank in same town.
Station mark: Center of tank.

[Latitude 37° 29′ 45.251″. Longitude 120° 50′ 23.269″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Orestimba	60	53	34.74	240	39	32.06	4.5920418	24.288
Black Gulch	81	42	29.84	261	28	27.24	4.5365767	21.376
Joven	88	23	38.38	268	18	03.75	4.1306910	8.395
Kern	89	56	53.05	269	42	41.20	4.5362790	21.361
Oso	91	45	32.87	271	26	03.08	4.6740870	29.338
Westport	110	26	45.69	290	19	48.76	4.2536186	11.142
Keyes	134	59	54.45	314	57	21.56	3.9401931	5.414
Ceres	136	21	18.80	316	17	10.62	4.1606864	8.996
Modesto	140	53	43.16	320	48	12.87	4.3233657	13.083
Hughson	168	48	32.91	348	47	37.56	4.0599436	7.133
Waterford	203	27	38.03	23	30	34.60	4.2512474	11.081
Hickman	209	45	31.46	29	48	51.82	4.2105739	10.091
Hagen	223	08	56.18	43	14	28.32	4.2908557	12.140
Hall	224	29	55.41	44	33	56.05	4.1406707	8.591
Denair	228	43	00.23	48	44	43.35	3.7430046	3.438
Montpelier	243	12	07.68	63	16	59.24	4.1194054	8.180
Dallas	270	54	01.77	90	57	36.79	3.9384440	5.393

VAN ORMER, STANISLAUS COUNTY, CAL. (Not occupied.)

Station mark: Center of the most western stack at oil pumping station at Van Ormer, on the Southern Pacific Railroad.

[Latitude 37° 29′ 59.472″. Longitude 121° 08′ 53.350″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Orestimba	19	15	38.21	199	12	49.78	4.3154824	12.848
Black Gulch	51	01	35.47	230	58	48.22	3.9390751	5.400
Kern	85	40	33.25	265	37	37.09	3.8530434	4.430

VERNALIS, SAN JOAQUIN COUNTY, CAL.

Station mark: Center of smokestack at Vernalis pumping station on Southern Pacific Railroad, 12 miles southeast of Tracy, Cal.

[Latitude 37° 37′ 35.628″. Longitude 121° 16′ 57.991″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Oso	31	20	11.82	211	16	52.58	4.1884572	9.590
Moy	88	07	28.82	268	03	55.97	3.9322097	5.316
Bell	198	43	35.73	18	45	27.11	4.1427815	8.632
Mill	216	51	31.94	36	54	50.91	4.1235570	8.259
Salida	241	58	47.06	62	06	02.43	4.2959553	12.283
Patrick	247	16	30.11	67	20	41.04	4.0380988	6.783
Butler	264	52	42.58	84	58	45.18	4.1648865	9.083
Modesto	265	51	47.83	86	02	30.84	4.4130241	16.083
Kern	341	49	00.54	161	50	59.57	4.1866652	9.550
Black Gulch	345	12	47.07	165	14	54.87	4.3053402	12.551

VERNALIS WINDMILL, STANISLAUS COUNTY, CAL. (Not occupied.)

A lone windmill about 3½ miles southeast of Vernalis, a station on the Southern Pacific Railroad.
Station mark: Center of windmill tower.

[Latitude 37° 36′ 08.090″. Longitude 121° 14′ 20.674″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Oso	48	36	39.08	228	31	44.00	4.1999876	9.848
Moy	101	03	09.38	280	58	00.57	4.1018339	7.856
Kern	355	31	29.44	175	31	52.56	4.0770460	7.420

WALTERS, STANISLAUS COUNTY, CAL.

A lumber tripod on butte about a mile south of county road from Oakdale to Coopers-town, about 9 miles southeast of Oakdale on Mr. G. C. Walter's place.

Station mark: An iron bench-mark post, under center of tripod.

[Latitude 37° 43′ 36.462″. Longitude 120° 42′ 48.206″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Waterford	23	38	14.41	203	36	33.27	4.0050559	6.286
Levison	63	56	30.78	243	52	15.77	4.0558776	7.067
Modesto	69	14	36.69	249	04	27.35	4.4171911	16.238
Riverbank	92	15	38.32	272	07	25.81	4.2949652	12.255
Crane	95	53	00.04	275	46	52.64	4.1695734	9.182
Windmill	107	58	19.08	287	56	26.76	3.6743535	2.936
Oakdale	121	11	33.11	301	06	18.92	4.1665594	9.118
Cashman	202	39	35.26	22	40	22.24	3.6880395	3.030
Wolfling	264	49	56.10	84	53	19.55	3.9124446	5.079
No. 1	308	27	40.82	128	31	34.80	4.0784010	7.443
Hagen	349	03	05.11	169	03	59.99	4.0642228	7.204

WATERFORD, STANISLAUS COUNTY, CAL. (Not occupied.)

A church spire, with red roof, in town of Waterford, a station on the Santa Fe Railway.

Station mark: Center of spire.

[Latitude 37° 38′ 35.805″. Longitude 120° 45′ 33.664″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Turlock	23	30	54.60	203	27	38.03	4.2512474	11.081
Hughson	61	23	30.26	241	19	38.04	4.0265409	6.605
Levison	124	42	46.12	304	40	12.44	3.8748880	4.658
Walters	203	36	33.27	23	38	14.41	4.0050559	6.286
Hagen	288	38	22.45	108	40	58.32	3.8199323	4.105
Hall	338	19	11.54	158	20	15.83	3.8448338	4.347
Dallas	354	35	12.58	174	35	51.39	4.2193571	10.297

WATSONVILLE, SANTA CRUZ COUNTY, CAL. (Not occupied.)

Station mark: Center of spire on a church in Watsonville.

[Latitude 36° 54′ 53.375″. Longitude 121° 45′ 38.276″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Bartlett	63	54	09.97	243	51	39.96	3.8381432	4.280
Lux	95	31	10.30	275	23	08.83	4.2997344	12.390
Gavilan	309	19	46.67	129	28	26.40	4.4440520	17.274
Pajaro	350	47	06.85	170	47	22.36	3.6016018	2.483

WESTLEY, STANISLAUS COUNTY, CAL. (Not occupied.)

Station mark center of water tank at school on west side of town of Westley on the Southern Pacific Railroad.

[Latitude 37° 32′ 41.426″. Longitude 121° 11′ 56.091″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Black Gulch	12	13	00.52	192	12	04.43	4.0295501	6.651
Kern	25	20	16.06	205	19	11.11	3.7868921	3.804
Oso	75	07	29.71	255	01	06.76	4.2034832	9.927

WESTPORT, STANISLAUS COUNTY, CAL.

Station mark center of steeple on Westport Methodist Episcopal Church.

[Latitude 37° 33′ 07.882″. Longitude 121° 01′ 47.773″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Orestimba	34	20	54.20	214	13	47.10	4,4865596	19.051
Black Gulch	56	48	56.84	236	41	50.42	4.3132812	12.783
Kern	70	10	42.66	250	03	27.19	4.2711272	11.600
Oso	80	52	57.21	260	40	23.66	4.4881356	19.120
Moy	104	35	33.88	284	21	46.00	4.5037590	19.820
Courtney	172	29	10.94	352	28	57.79	3.6072166	2.515
Modesto	199	08	58.02	19	10	25.15	4.0282731	6.632
Ceres	238	08	43.34	58	11	32.38	3,9034910	4.976
Turlock	290	19	48.76	110	26	45.69	4.2536186	11.142
Joven	333	29	35.53	153	30	57.60	3.8701367	4.608

WINDMILL, STANISLAUS COUNTY, CAL. (Not occupied.)

A steel windmill near old barn and deserted shack on south side of Oakdale and Cooperstown road, 7 miles southeast of Oakdale.

Station mark center of windmill tower.

[Latitude 37° 44′ 23.705″. Longitude 120° 45′ 51.749″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Levison	41	32	04.99	221	29	42.22	3.9357975	5.360
Crane	90	17	17.82	270	13	02.71	4.0088101	6.341
Cashman	244	27	10.84	64	29	50.20	3.8488699	4.388
Walters	287	56	26.76	107	58	19.08	3.6743535	2.936

YOUNG, STANISLAUS COUNTY, CAL.

A high wooden windmill on Mr. William Young's place, about 6 miles southwest of Modesto. The windmill is north of the white tank house and dwelling on the north side of the road.

Station mark: Center of windmill tower.

[Latitude 37° 36′ 35.902″. Longitude 121° 05′ 22.362″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Kern	43	56	41.34	223	51	36.36	4.2482795	11.006
Butler	141	27	59.09	321	26	56.94	3.6027343	2.489
Theobald	203	09	16.91	23	09	52.92	3.5655681	2.285
Modesto	247	15	25.78	67	19	03.96	3.9777506	5.903

Arena, Atwater, Cressy, Gustine, Merced, Mitchell School, Stevenson, Turlock, and Winton 7½′ quadrangles, and Edendale 15′ quadrangle.

MERCED AND STANISLAUS COUNTIES.

During the season of 1914 C. L. Nelson extended triangulation over the above-named quadrangles. The work was based on stations Bloodsoe, Dallas, Joven, Thomsen, and Turlock, previously located in this area, on North American datum. Twenty-seven new stations were occupied and 17 points were located by intersection.

AMSTERDAM, MERCED COUNTY, CAL.

A lumber tripod on hill about 1 mile southwest of Amsterdam.
Station mark: Iron post under center of tripod.

[Latitude 37° 25′ 38.816″. Longitude 120° 33′ 07.606″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
R. R. Red	10	56	38.38	190	56	01.69	3.8938515	4.866
Winton	49	51	05.64	229	48	54.14	3.8430305	4.329
Cressy	85	34	29.97	265	29	17.70	4.1029013	7.875
Dallas	114	01	38.55	293	54	43.51	4.2637301	11.405
Dry Creek	139	38	56.82	319	37	02.88	3.8519179	4.418
Bloodsoe	156	16	12.62	336	14	28.91	4.0171954	6.465
Thomsen	200	33	40.76	20	35	27.51	4.0886622	7.621
Wassom	250	44	21.65	70	47	00.81	3.8336014	4.236
Super	269	07	10.50	89	11	44.09	4.0441140	6.878
Blacksmith	278	29	30.80	98	35	36.48	4.1750801	9.299
Lighthouse	291	10	12.23	111	11	05.65	3.3651171	1.440
Nairn	335	21	47.35	155	23	01.72	3.8590502	4.492
Merced	335	30	18.05	155	32	48.29	4.1674108	9.136

BLACKSMITH, MERCED COUNTY, CAL.

A lumber signal on top of pasture hill about 2 miles northeast of Merced reservoir.
Station mark: An iron post under a cairn.

[Latitude 37° 24′ 26.708″. Longitude 120° 23′ 05.779″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Merced	38	01	52.87	217	58	17.90	4.1511041	8.800
Lakeside School	38	26	17.53	218	24	34.38	3.8277024	4.179
Nairn	69	48	02.42	249	43	11.34	4.0992809	7.810
Lighthouse	96	18	00.51	276	12	48.26	4.1042753	7.900
Amsterdam	98	35	36.48	278	29	30.80	4.1750801	9.299
Wassom	118	09	29.67	298	06	03.03	3.9767853	5.890
Super	122	37	10.43	302	35	38.27	3.6461410	2.751
Hurricane	321	23	46.90	141	25	40.76	3.8690886	4.597
South Point	337	23	40.96	157	25	55.17	4.1515650	8.809
Monument	357	06	20.74	177	06	36.17	4.0937836	7.711

BLOODSOE, MERCED COUNTY, CAL.

Lumber tripod on pasture hill of Mr. G. W. Bloodsoe's ranch. Nearest stopping place is Hickman, 6 miles southwest of Montpelier on the Santa Fe Railroad.

Station mark: An iron post set under center of tripod.

[Latitude 37° 30′ 47.722″. Longitude 120° 35′ 58.085″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Winton	4	36	53.25	184	36	25.28	4.1480588	8.738
Dry Creek	5	46	28.07	185	46	17.78	3.6155633	2.564
Roadmill	63	13	16.00	243	11	19.16	3.7227303	3.282
Dallas	80	42	32.53	260	37	20.87	4.1052710	7.918
Thomsen	256	58	57.48	77	02	28.16	3.9403839	5.417
Tank	276	47	18.26	96	52	57.07	4.1387903	8.553
Super	301	29	16.60	121	35	34.17	4.2527132	11.119
Wassom	304	22	46.12	124	27	09.18	4.1097493	8.000
Lighthouse	328	28	32.32	148	31	09.49	4.0846315	7.551
Amsterdam	336	14	28.91	156	16	12.62	4.0171954	6.465

BRIDGE, MERCED COUNTY, CAL.

A lumber tripod about 150 yards northeast of State highway and Southern Pacific Railroad, about 300 yards north of Merced River.

Station mark: An iron post under center of tripod.

[Latitude 37° 24′ 13.379″. Longitude 120° 44′ 36.961″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Leedom	133	16	25.43	313	14	35.83	3.7845550	3.784
Turlock	140	16	10.55	320	12	39.99	4.1241505	8.270
Dallas	180	58	02.59	0	58	06.81	4,0039658	6.271
Winton	279	02	38.12	99	07	25.31	4.0711270	7.319
Livingston	315	57	59.11	135	58	47.95	3.4542817	1.769
Swansen	338	56	32.61	158	57	55.30	3.9701677	5.801
Curtner	354	35	43.61	174	35	56.70	3.7508378	3.501

CURTNER, MERCED COUNTY, CAL.

A lumber tripod on top of low sand hill on Curtner ranch, about 3 miles southwest of Livingston and about one-half mile south of east-west oiled road and about one-half mile west of north-south oiled road.

Station mark: Iron bench-mark post set under center of tripod.

[Latitude 37° 21′ 11.429″. Longitude 120° 44′ 15.399″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Stilt	18	26	58.02	198	25	39.09	4.0060185	6.300
Tarweed	31	38	45.33	211	37	43.76	3.6780040	2.960
Tree Mill	92	42	59.33	272	40	01.23	3.8592457	4.494
Bridge	174	35	56.70	354	35	43.61	3.7508378	3.501
Livingston	202	07	01.80	22	07	37.52	3.5849892	2.390
Winton	251	18	19.26	71	22	53.19	4.0689655	7.283
W. C.	279	14	11.53	99	17	47.81	3.9489693	5.525
Swansen	317	42	15.41	137	43	24.97	3.6228253	2.607

CRESSEY, MERCED COUNTY, CAL.

On summit of hill 1 mile west of town of Cressey, on the Santa Fe Railway, about 100 feet south of road and about 200 yards southeast of Merced River.

Signal: A lumber tripod.

Station mark: An iron post.

[Latitude 37° 25′ 06.788″. Longitude 120° 41′ 41.470″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Turlock	123	50	33.30	303	45	15.97	4.1884452	9.590
Dallas	153	52	51.22	333	51	08.71	3.9733707	5.844
Amsterdam	265	29	17.70	85	34	29.97	4.1029013	7.875
Winton	295	35	10.52	115	38	11.16	3.9090948	5.040

DALLAS, STANISLAUS OR MERCED COUNTY, CAL.

A lumber tripod on Mrs. Hickman's land, located about 5½ miles due east of Turlock and 500 feet north of county road running from Turlock to Snelling.

Station mark: Triangulation tablet set in rock under center of tripod.

[Latitude 37° 29′ 40.680″. Longitude 120° 44′ 30.025″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Bridge	0	58	06.81	180	58	02.59	4.0039658	6.271
Leedom	37	53	22.72	217	51	28.79	3.8748583	4.658
Turlock	90	57	36.79	270	54	01.77	3.9384440	5.393
Bloodsoe	260	37	20.87	80	42	32.53	4.1052710	7.918
Road Mill	272	15	35.01	92	18	49.78	3.8958438	4.889
Dry Creek	279	28	23.83	99	33	25.09	4.0910301	7.663
Amsterdam	293	54	43.51	114	01	38.55	4.2637301	11.405
Winton	316	10	27.13	136	15	10.40	4.2188775	10.286
Cressey	333	51	08.71	153	52	51.22	3.9733707	5.844

DRY CREEK, MERCED COUNTY, CAL.

On summit of hill about 100 yards northeast of road and 200 yards northwest of Dry Creek.

Station mark: A bottle buried in the ground under center of tripod and under an iron post.

[Latitude 37° 28′ 34.555″. Longitude 120° 36′ 14.981″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Winton	4	07	49.47	184	07	31.77	3.9972663	6.175
Dallas	99	33	25.09	279	28	23.83	4.0910301	7.663
Road Mill	111	52	07.52	291	50	21.02	3.6658718	2.879
Bloodsoe	185	46	17.78	5	46	28.07	3.6155633	2.564
Thomsen	235	43	56.50	55	47	37.38	4.0325899	6.698
Tank	260	01	02.81	80	06	51.76	4.1553506	8.886
Wassom	285	59	28.96	106	04	02.18	4.0601601	7.137
Lighthouse	312	43	41.72	132	46	29.10	3.9644879	5.726
Amsterdam	319	37	02.88	139	38	56.82	3.8519179	4.418

EAST END, MERCED COUNTY, CAL. (Not occupied.)

[Latitude 37° 09′ 04.701″. Longitude 120° 41′ 38.253″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Lizard	180	06	27.61	0	06	28.24	4.1346065	8.471
Lost	208	44	40.75	28	46	18.86	3.9202851	5.172

EYRAUD (1), MERCED COUNTY, CAL.

High cement silo on the Eyraud ranch, about 7 miles southeast of Atwater.

[Latitude 37° 13′ 39.437″. Longitude 120° 33′ 12.037″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Merced	215	11	50.41	35	14	22.99	4.0320386	6.689
Hurricane	233	59	53.82	54	07	54.76	4.3828852	15.005
Monument	244	02	35.39	64	08	57.85	4.2381552	10.752
South Point	251	19	24.08	71	27	45.04	4.3327504	13.369

EYRAUD (2), MERCED COUNTY, CAL.

High cement silo on the Eyraud ranch, about 7 miles southeast of Atwater.
Station mark: Center of silo.

[Latitude 37° 13′ 39.353″. Longitude 120° 33′ 12.146″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Red chimney	38	27	31.29	218	26	31.97	3.5898351	2.416
Poplar A	49	28	44.79	229	26	41.03	3.8221991	4.126
Poplar C	49	52	43.79	229	50	07.29	3.9216519	5.188
Lost	82	10	01.39	262	06	33.44	3.9322484	5.316
Horse	115	11	47.45	295	08	56.54	3.8859770	4.779

HORSE, MERCED COUNTY, CAL.

A lumber tripod 6 miles south of Atwater, 40 yards east of tributary to Black Rascal Creek, and 20 feet east of unfenced road to white ranch buildings that lie about 0.8 mile to the south.
Station mark: Iron bench-mark post.

[Latitude 37° 15′ 25.469″. Longitude 120° 37′ 54.549″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Lost	18	48	38.61	198	48	01.48	3.6713635	2.916
Lizard	109	04	36.54	289	02	21.72	3.7637639	3.607
W. C	176	17	24.54	356	17	09.80	3.9662765	5.749
Eyraud (2)	295	08	56.54	115	11	47.45	3.8859770	4.779
Poplar A	345	49	11.54	165	49	58.57	3.8935345	4.863
Poplar C	356	09	10.31	176	09	24.57	3.9381907	5.389

HURRICANE, MERCED COUNTY, CAL.

Low signal with cloth frames and wound with barbed wire on prominent round hill about 1½ miles northeast of deserted cattle-ranch building.
Station mark: Iron bench-mark post.

[Latitude 37° 21′ 19.143″. Longitude 120° 19′ 58.235″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Monument	31	07	40.84	211	06	02.55	3.8878027	4.799
Eyraud (1)	54	07	54.76	233	59	53.82	4.3828852	15.005
Merced	68	05	31.15	248	00	02.58	4.1578133	8.936
Lakeside School	93	22	18.27	273	18	41.38	3.9450425	5.475
Lighthouse	112	36	59.49	292	29	53.55	4.2715056	11.611
Blacksmith	141	25	40.76	321	23	46.90	3.8690886	4.597
South Point	353	31	22.38	173	31	42.80	3.8665005	4.569

JOVEN, STANISLAUS COUNTY, CAL.

A wooden windmill just east of flat-roofed tank house, which may be occupied, 9 miles west of Turlock on Mr. Young's place.

Station mark: Center of windmill tower.

[Latitude 37° 29′ 32.613″. Longitude 120° 59′ 33.051″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Taylor	29	36	00.35	209	34	52.01	3.7474348	3.474
North Mill	86	14	20.40	266	12	59.94	3.5124963	2.022
Turlock	268	18	03.75	88	23	38.38	4.1306910	8.395
West End	299	36	46.86	119	39	00.99	3.7945667	3.872
Flagstaff	304	08	54.50	124	10	51.52	3.7559769	3.543
New Tower	332	58	31.51	153	00	44.70	4.0740378	7.369
Lone Mill	343	31	47.70	163	32	35.67	3.8349871	4.250

LAKESIDE SCHOOL, MERCED COUNTY, CAL. (Not occupied.)

Station mark: Cupola of Lakeside School, southwest of Merced reservoir.

[Latitude 37° 21′ 35.803″. Longitude 120° 25′ 55.669″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Merced	37	38	05.17	217	36	13.34	3.8713685	4.621
Nairn	96	55	09.99	276	52	02.17	3.8848483	4.766
Lighthouse	128	12	24.45	308	08	55.53	4.0320428	6.690
Super	183	20	58.75	3	21	09.81	3.8846584	4.764
Blacksmith	218	24	34.38	38	26	17.53	3.8277024	4.179
Hurricane	273	18	41.38	93	22	18.27	3.9450425	5.475

LEEDOM, MERCED COUNTY, CAL.

Station is mill on tank tower which forms part of dwelling house on Leedom's ranch, 1 mile west of Delhi, on the Southern Pacific Railroad. The owner of the house lives about 200 yards east of tank house. Station is about 100 feet south of road.

Observation platform was built on top of tank roof and occupied.

Station mark: Center of windmill.

[Latitude 37° 26′ 28.734″. Longitude 120° 47′ 37.310″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Turlock	146	04	03.58	336	02	22.64	3.8635084	4.538
Dallas	217	51	28.79	37	53	22.72	3.8748583	4.658
Bridge	313	14	35.83	133	16	25.43	3.7845550	3.784

LIGHTHOUSE, MERCED COUNTY, CAL.

Willow tree set in top of Lighthouse Hill, about three-quarters of a mile south of Amsterdam, about one-quarter mile west of road and railroad.

Station mark: Center of willow signal tree.

[Latitude 37° 25′ 11.653″. Longitude 120° 31′ 39.699″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
R. R. Red	28	02	53.19	208	01	23.12	3.8900205	4.824
Winton	63	59	40.64	243	56	25.75	3.9207112	5.177
Amsterdam	111	11	05.65	291	10	12.23	3.3651171	1.440
Dry Creek	132	46	29.10	312	43	41.72	3.9644879	5.726
Bloodsoe	148	31	09.49	328	28	32.32	4.0846315	7.551
Thomsen	189	53	42.81	9	54	36.07	4.0971237	7.771
Wassom	234	11	06.33	54	12	52.04	3.7219397	3.276
Super	263	33	45.75	83	37	25.89	3.9524544	5.569
Blacksmith	276	12	48.26	96	18	00.51	4.1042753	7.900
Hurricane	292	29	53.55	112	36	59.49	4.2715056	11.611
Lakeside School	308	08	55.53	128	12	24.45	4.0320428	6.690
Merced	342	35	55.06	162	37	31.95	4.1187726	8.168
Nairn	351	33	53.35	171	34	14.33	3.7631514	3.602

LIVINGSTON, MERCED COUNTY, CAL. (Not occupied.)

White tower on church just east of Hotel Idanha in Livingston. Tower can be occupied.

Station mark: Center of tower.

[Latitude 37° 23′ 06.995″. Longitude 120° 43′ 16.540″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Curtner	22	07	37.52	202	07	01.80	3.5849892	2.390
Bridge	135	58	47.95	315	57	59.11	3.4542817	1.769

LIZARD, MERCED COUNTY, CAL.

A lumber tripod signal on high sand dune about 4 miles south of Swansen.

Station mark: Iron bench-mark post set under center of tripod.

[Latitude 37° 16′ 26.951″. Longitude 120° 41′ 37.213″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
East End	0	06	28.24	180	06	27.61	4.1346065	8.471
Tree J	52	57	00.47	232	53	47.31	3.9938074	6.126
Stilt	83	12	36.17	263	09	41.51	3.8547100	4.447
Tarweed	126	24	29.44	306	21	52.07	3.9001301	4.937
Swansen	169	17	47.36	349	17	21.00	3.7608871	3.583
W. C	213	37	55.09	33	39	55.30	3.9452260	5.477
Horse	289	02	21.72	109	04	36.54	3.7637693	3.667
Lost	327	53	03.24	147	54	40.86	3.8739444	4.648

LONE MILL, STANISLAUS COUNTY, CAL.

Iron mill near watering trough in large field. A galvanized-iron tank, about 4 feet off the ground, lies about 10 feet to the northwest.

Station mark: Center of mill.

[Latitude 37° 25′ 59.873″. Longitude 120° 58′ 14.185″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Taylor	109	52	17.09	289	50	20.85	3.6987425	3.105
Joven	163	32	35.67	343	31	47.70	3.8349871	4.250
West End	225	00	19.88	45	01	45.96	3.6919416	3.057
Turlock	238	58	47.85	59	03	34.29	4.1302786	8.387
New Tower	319	16	49.76	139	18	14.94	3.7231345	3.285

LOST, MERCED COUNTY, CAL.

A lumber tripod 7 miles southwest of Atwater, on low levee, about one-half mile south of junction of two sloughs.

Station mark: An iron post.

[Latitude 37° 13′ 01.391″. Longitude 120° 38′ 55.911″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
East End	28	46	18.86	208	44	40.75	3.9202851	5.172
Lizard	147	54	40.86	327	53	03.24	3.8739444	4.648
Horse	198	48	01.48	18	48	38.61	3.6713635	2.915
Eyraud	262	06	33.44	82	10	01.39	3.9322484	5.316
Red Chimney	287	10	46.94	107	13	15.51	3.8022145	3.941
Poplar A	312	30	35.24	132	31	59.35	3.6678604	2.892
Poplar C	333	33	07.14	153	33	58.49	3.6725273	2.923

MERCED, MERCED COUNTY, CAL.

Center of cupola of courthouse in Merced.

[Latitude 37° 18′ 24.733″. Longitude 120° 29′ 00.061″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Eyraud	35	14	22.99	215	11	50.41	4.0320386	6.689
Winton	127	55	52.07	307	51	10.57	4.1605318	8.993
Amsterdam	155	32	48.29	335	30	18.05	4.1674108	9.136
Nairn	155	41	02.32	335	39	46.45	3.8735923	4.645
Lighthouse	162	37	31.95	342	35	55.06	4.1187726	8.168
Wassom	181	17	09.35	1	17	18.02	4.1940220	9.713
Super	200	11	26.66	20	13	29.63	4.1593636	8.968
Lakeside School	217	36	13.34	37	38	05.17	3.8713685	4.621
Blacksmith	217	58	17.90	38	01	52.87	4.1511041	8.800
Hurricane	248	00	02.58	68	05	31.15	4.1578133	8.936
Monument	277	29	37.49	97	33	27.60	3.9746578	5.861
South Point	277	42	19.29	97	48	08.02	4.1554871	8.889

MILL, MERCED COUNTY, CAL. (Not occupied.)

Lone windmill on wooden mill tower, with bunch of low willows against tower on the south side.

[Latitude 37° 17′ 49.162″. Longitude 120° 49′ 35.400″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Tarweed	247	55	57.15	67	58	09.56	3.7638013	3.607
Stilt	305	52	47.32	125	54	42.27	3.7612400	3.586

MITCHELL SCHOOL (FLAGSTAFF), STANISLAUS COUNTY, CAL. (Not occupied.)

Station mark: White staff, west of yellow building with red roof. Appears from a distance as though it might be a school.

[Latitude 37° 27′ 48.758″. Longitude 120° 56′ 21.054″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Taylor	77	31	00.35	257	27	55.27	3.8843254	4.761
Joven	124	10	51.32	304	08	54.50	3.7559769	3.543

MONUMENT, MERCED COUNTY, CAL. (Not occupied.)

Station mark: Tall white shaft about 5 miles east of Merced near Santa Fe Railway.

[Latitude 37° 17′ 44.657″. Longitude 120° 22′ 40.337″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Eyraud	64	08	57.85	244	02	35.39	4.2381552	10.752
Merced	97	33	27.60	277	29	37.49	3.9746578	5.861
Super	163	35	07.18	343	33	19.70	4.1877880	9.575
Blacksmith	177	06	36.17	357	06	36.17	4.0937836	7.711
Hurricane	211	06	02.55	31	07	40.84	3.8878027	4.799

NAIRN, MERCED COUNTY, CAL.

Lone mill, with watering trough, 1 mile southwest of Nairn, on Oakdale Merced branch of Southern Pacific Railroad.

Station mark: Center of windmill tower.

[Latitude 37° 22′ 05.668″. Longitude 120° 31′ 05.145″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Winton	104	01	03.11	283	57	37.36	3.9341807	5.340
Amsterdam	155	23	01.72	335	22	47.34	3.8590502	4.492
Lighthouse	171	34	14.33	351	33	53.35	3.7631514	3.602
Super	230	05	44.41	50	09	03.44	4.0213085	6.526
Blacksmith	249	43	11.34	69	48	02.42	4.0992809	7.810
Lakeside School	276	52	02.17	96	55	09.99	3.8848483	4.766
Merced	335	39	46.45	155	41	02.32	3.8735923	4.645

NEW TOWER, MERCED COUNTY, CAL. (Not occupied.)

New yellow tank tower building that shows prominently from the north and west with an afternoon sun. Viewed from Lone Mill, only the upper part is visible and is partly concealed by the tops of two poplars. The triangulator has not been at the station and can give no better description. Tower has the usual pyramid-shaped roof with not much pitch.

[Latitude 37° 23′ 49.893″. Longitude 120° 55′ 53.988″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Taylor	125	01	18.26	304	57	56.87	3.9976891	6.181
Lone Mill	139	18	14.94	319	16	49.76	3.7231345	3.285
Joven	153	00	44.70	332	58	31.51	4.0740378	7.369

NORTH MILL, STANISLAUS COUNTY, CAL. (Not occupied.)

Lone mill on tank on open timber structure about 2 miles north of Taylor and 2 miles west of Joven.

Station mark: Center of windmill tower.

[Latitude 37° 29′ 25.668″. Longitude 121° 01′ 45.247″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Joven	266 12 59.94	86 14 20.40	3.5124963	2.022
Taylor	354 00 14.13	174 00 26.21	3.6695605	2.903

POPLAR A, MERCED COUNTY, CAL. (Not occupied.)

[Latitude 37° 11′ 19.348″. Longitude 120° 36′ 36.805″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Lost	132 31 59.35	312 30 35.24	3.6678604	2.892
Horse	165 49 58.57	345 49 11.54	3.8935345	4.863
Eyraud	229 26 41.03	49 28 44.79	3.8221991	4.126

POPLAR C, MERCED COUNTY, CAL. (Not occupied.)

[Latitude 37° 10′ 44.743″. Longitude 120° 37′ 30.967″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Lost	153 33 58.49	333 33 07.14	3.6725273	2.923
Horse	176 09 24.57	356 09 10.31	3.9381907	5.389
Eyraud	229 50 07.29	49 52 43.79	3.9216519	5.188

RED CHIMNEY, MERCED COUNTY, CAL.

[Latitude 37° 12′ 00.557″. Longitude 120° 34′ 50.226″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Lost	107 13 15.51	287 10 46.94	3.8022145	3.941
Eyraud	218 26 31.97	38 27 31.29	3.5898351	2.416

ROAD MILL, MERCED COUNTY, CAL. (Not occupied.)

Station is mill near tank on low structure about one-quarter mile southwest of school and about 100 feet south of road between Turlock and Snelling. The mill is on line of that section of road between itself and Dallas.

Station mark: Center of windmill tower.

[Latitude 37° 29′ 30.497″. Longitude 120° 39′ 10.008″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Dallas	92 18 49.78	272 15 35.01	3.8958438	4.889
Bloodsoe	243 11 19.16	63 13 16.00	3.7227303	3.282
Dry Creek	291 50 21.02	111 52 07.52	3.6658718	2.879

R. R. RED, MERCED COUNTY, CAL. (Not occupied.)

Red tank on timber structure among group of red railroad buildings on Santa Fe Railway about 3 miles southeast of Winton.

Station mark: Center of tank.

[Latitude 37° 21′ 29.394″. Longitude 120° 34′ 08.023″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Winton	129	46	57.91	309	45	23.19	3.6985837	3.104
Amsterdam	190	56	01.69	10	56	38.38	3.8938515	4.866
Lighthouse	208	01	23.12	28	02	53.19	3.8900205	4.824

SOUTH POINT, MERCED COUNTY, CAL. (Not occupied.)

Tall green water tank on high open timber structure on Santa Fe Railroad about 8 miles east of Merced.

Station mark: Center of tank.

[Latitude 37° 17′ 22.128″. Longitude 120° 19′ 24.558″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Eyraud	71	27	45.04	251	19	24.08	4.3327504	13.369
Merced	97	48	08.02	277	42	19.29	4.1554871	8.889
Super	149	21	48.64	329	18	02.37	4.2550564	11.179
Blacksmith	157	25	55.17	337	23	40.96	4.1515650	8.809
Hurricane	173	31	42.80	353	31	22.38	3.8665005	4.569

STILT, MERCED COUNTY, CAL.

A lumber tripod on sand dune one-half mile north of trees skirting slough and about 3 miles south of Bloss ranch buildings.

Station mark: An iron bench-mark post under center of tripod.

[Latitude 37° 15′ 59.407″. Longitude 120° 46′ 25.630″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Tree J	8	27	21.51	188	27	02.92	3.7118323	3.200
Mill	125	54	42.27	305	52	47.32	3.7612400	3.586
Tarweed	187	14	35.67	7	14	53.06	3.7487691	3.484
Curtner	198	25	39.09	18	26	58.02	4.0060185	6.300
Swansen	222	46	36.92	42	49	05.33	3.9483550	5.517
Lizard	263	09	41.51	83	12	36.17	3.8547100	4.447

SUPER, MERCED COUNTY, CAL.

A lumber tripod with target signal on plateau about 2 miles north of Merced municipal reservoir.

Station mark: An iron bench-mark post.

[Latitude 37° 25′ 44.095″. Longitude 120° 25′ 37.447″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Lakeside School	3	21	09.81	183	20	58.75	3.8846584	4.764
Merced	20	13	29.63	200	11	26.66	4.1593636	8.968
Nairn	50	09	03.44	230	05	44.41	4.0213085	6.526
Winton	74	12	02.61	254	05	17.64	4.2315483	10.590
Lighthouse	83	37	25.89	263	33	45.75	3.9524544	5.569
Amsterdam	89	11	44.00	269	07	10.50	4.0441140	6.878
Wassom	114	14	36.15	294	12	41.67	3.7056314	3.155
Bloodsoe	121	35	34.17	301	29	16.60	4.2527132	11.119
Thomsen	149	12	56.96	329	10	09.80	4.1198947	8.189
Blacksmith	302	35	38.27	122	37	10.43	3.6461410	2.751
South Point	329	18	02.37	149	21	48.64	4.2550564	11.179
Monument	343	33	19.70	163	35	07.18	4.1877880	9.575

SWANSEN, MERCED COUNTY, CAL.

Mill on red tank house on Ed. Swansen's ranch about 5 miles south of Livingston. There is a lumber observing platform built on the top of tank house which the topographer is requested to remove when he no longer needs it.

Station mark: Center of windmill tower.

[Latitude 37° 19′ 30.738″. Longitude 120° 42′ 20.711″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Stilt	42	49	05.33	222	46	36.92	3.9483550	5.517
Tarweed	79	52	37.10	259	50	26.02	3.7330266	3.360
Curtner	137	43	24.97	317	42	15.41	3.6228253	2.607
Bridge	158	57	55.30	338	56	32.61	3.9701677	5.801
Winton	230	22	18.87	50	25	43.13	4.0314934	6.681
W. C	254	17	23.16	74	19	49.82	3.7912704	3.843
Lizard	349	17	21.00	169	17	47.36	3.7608871	3.583

TANK, MERCED COUNTY, CAL. (Not occupied.)

Red-roofed tank house, northeast of house. The tank house appears to have small balustrade around top. The buildings are white with red tops.

Station is south of Merced River between the river bottom and foothills in open country.

Station mark: Center of tank house.

[Latitude 37° 29′ 54.579″. Longitude 120° 26′ 41.617″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Wassom	28	25	45.53	208	24	29.98	3.8069400	3.974
Dry Creek	80	06	51.76	260	01	02.81	4.1553506	8.886
Bloodsoe	96	52	57.07	276	47	18.26	4.1387903	8.553
Thomsen	124	50	44.42	304	48	36.20	3.7992856	3.914

TARWEED, MERCED COUNTY, CAL.

A lumber tripod on top of small hill about 1 mile northeast of Bloss ranch buildings and about 5 miles southwest of Livingston.

Station mark: An iron bench-mark post set under center of tripod.

[Latitude 37° 18′ 59.851″. Longitude 120° 45′ 56.918″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Stilt	7	14	53.06	187	14	35.67	3.7487691	3.484
Mill	67	58	09.56	247	55	57.15	3.7638013	3.607
Tree Mill	132	56	26.66	312	54	30.21	3.8098806	4.011
Curtner	211	37	43.76	31	38	45.33	3.6780040	2.960
Swansen	259	50	26.02	79	52	37.10	3.7330266	3.360
Lizard	306	21	52.07	126	24	29.44	3.9001301	4.937

TAYLOR, STANISLAUS COUNTY, CAL.

Mill on red tank about 30 feet northwest of dwelling house on Taylor ranch, on edge of slough, about 10 miles southwest of Turlock.

Station mark: Center of mill.

[Latitude 37° 26′ 54.930″. Longitude 121° 01′ 25.390″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
North Mill	174	00	26.21	354	00	14.13	3.6695605	2.903
Joven	209	34	52.01	29	36	00.35	3.7474348	3.474
Turlock	252	03	26.97	72	10	09.77	4.2328988	10.623
Flagstaff	257	27	55.27	77	31	00.35	3.8843254	4.761
West End	257	41	28.42	77	44	50.80	3.9227433	5.201
Lone Mill	289	50	20.85	109	52	17.09	3.6987425	3.105
New Tower	304	57	56.87	125	01	18.26	3.9976891	6.181

THOMSEN, MERCED COUNTY, CAL.

A lumber tripod on Henry Thomsen's place, 6 miles west of Snelling. Follow railroad from Snelling to Hopetown, then turn due west and take first main north and south road. Is about 2 miles north of house and about a quarter mile west of road.

Signal on a little butte but not marked.

[Latitude 37° 31′ 51.272″. Longitude 120° 30′ 12.169″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Lighthouse	9	54	36.07	189	53	42.81	4.0971237	7.771
Amsterdam	20	35	27.51	200	33	40.76	4.0886622	7.621
Winton	31	07	06.31	211	03	07.96	4.2707936	11.592
Dry Creek	55	47	37.38	235	43	56.50	4.0325899	6.698
Bloodsoe	77	02	28.16	256	58	57.48	3.9403839	5.417
Tank	304	48	36.20	124	50	44.42	3.7992856	3.914
Super	329	10	09.80	149	12	56.96	4.1198947	8.189
Wassom	347	03	11.48	167	04	04.05	3.9766622	5.889

TREE J, MERCED COUNTY, CAL. (Not occupied.)

[Latitude 37° 13′ 14.154″. Longitude 120° 46′ 56.349″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Stilt	188	27	02.92	8	27	21.51	3.7118323	3.200
Lizard	232	53	47.31	52	57	00.47	3.9938074	6.126

TREE MILL, MERCED COUNTY, CAL. (Not occupied.)

Lone windmill in disrepair; about 20 feet east of acacia or locust tree and about 1.5 miles south of wagon bridge over Merced River.

Station mark: Center of windmill.

[Latitude 37° 21′ 22.446″. Longitude 120° 49′ 08.922″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Curtner	272	40	01.23	92	42	59.33	3.8592457	4.494
Tarweed	312	54	30.21	132	56	26.66	3.8098806	4.011

TURLOCK, STANISLAUS COUNTY, CAL. (Not occupied by C. L. Nelson in 1914.)

An iron city tank in Turlock. It is east and north of twin tank in same town.
Station mark: Center of tank.

[Latitude 37° 29′ 45.251″. Longitude 120° 50′ 23.269″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Lone Mill	59	03	34.29	238	58	47.85	4.1302786	8.387
Taylor	72	10	09.77	252	03	26.97	4.2328988	10.623
Joven	88	23	38.38	268	18	03.75	4.1306910	8.395
Dallas	270	54	01.77	90	57	36.79	3.9384440	5.393
Cressy	303	45	15.97	123	50	33.30	4.1884452	9.590
Bridge	320	12	39.99	140	16	10.55	4.1241505	8.270
Leedom	326	02	22.64	146	04	03.58	3.8635084	4.538

WASSOM, MERCED COUNTY, CAL.

A lumber tripod on hill on Mr. Wassom's ranch, about 3 miles northeast of town of Amsterdam.
Station mark: An iron bench-mark post set under center of tripod.

[Latitude 37° 26′ 51.678″. Longitude 120° 28′ 45.789″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Merced	1	17	18.02	181	17	09.35	4.1940220	9.713
Lighthouse	54	12	52.04	234	11	06.33	3.7219397	3.276
Winton	60	13	30.09	240	08	39.46	4.1321170	8.423
Amsterdam	70	47	00.81	250	44	21.65	3.8336014	4.236
Dry Creek	106	04	02.18	285	59	28.96	4.0601601	7.137
Bloodsoe	124	27	09.18	304	22	46.12	4.1097493	8.000
Thomsen	167	04	04.05	347	03	11.48	3.9766622	5.889
Tank	208	24	29.98	28	25	45.53	3.8069400	3.984
Super	294	12	41.67	114	14	36.15	3.7056314	3.155
Blacksmith	298	06	03.03	118	09	29.67	3.9767853	5.890

W. C., MERCED COUNTY, CAL.

A lumber tripod signal on top of hill, 1 mile south of Southern Pacific Railroad and 2 miles west of Atwater, about 300 yards west of public road, on land belonging to W. C. Dallas.
Station mark: An iron bench-mark post.

[Latitude 37° 20′ 24.985″. Longitude 120° 38′ 18.871″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Lizard	33	39	55.30	213	37	55.09	3.9452260	5.477
Swansen	74	19	49.82	254	17	23.16	3.7912704	3.843
Curtner	99	17	47.81	279	14	11.53	3.9489693	5.525
Winton	204	13	48.04	24	14	45.57	3.7545134	3.531
Horse	356	17	09.80	176	17	24.54	3.9662765	5.749

WEST END, STANISLAUS COUNTY, CAL. (Not occupied.)

Station mark: West end of very high barn, with what appears to be galvanized-iron roof, with three pitches on either side.

[Latitude 37° 27′ 52.681″. Longitude 120° 55′ 52.613″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Lone Mill	45	01	45.96	225	00	19.88	3.6919416	3.057
Taylor	77	44	50.80	257	41	28.42	3.9227433	5.201
Joven	119	39	00.99	299	36	46.86	3.7945667	3.872

WINTON, MERCED COUNTY, CAL.

Station mark: Center of high tank in town of Winton, on the Santa Fe Railway.

[Latitude 37° 23′ 13.054″. Longitude 120° 36′ 44.077″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
W. C.	24	14	45.57	204	13	48.04	3.7545134	3.531
Swansen	50	25	43.13	230	22	18.87	4.0314934	6.681
Curtner	71	22	53.19	251	18	19.26	4.0689655	7.283
Bridge	99	07	25.31	279	02	38.12	4.0711270	7.319
Cressy	115	38	11.16	295	35	10.52	3.9090948	5.040
Dallas	136	15	10.40	316	10	27.13	4.2188775	10.286
Dry Creek	184	07	31.77	4	07	49.47	3.9972663	6.175
Bloodsoe	184	36	25.28	4	36	53.25	4.1480588	8.738
Thomsen	211	03	07.96	31	07	06.31	4.2707936	11.592
Amsterdam	229	48	54.14	49	51	05.64	3.8430305	4.329
Wassom	240	08	39.46	60	13	30.09	4.1321170	8.423
Lighthouse	243	56	35.75	63	59	40.64	3.9207112	5.177
Super	254	05	17.64	74	12	02.61	4.2315483	10.590
Nairn	283	57	37.36	104	01	03.11	3.9341807	5.340
Merced	307	51	10.57	127	55	52.07	4.1605318	8.993
R. R. Red	309	45	23.19	129	46	57.91	3.6985837	3.104

COLORADO.

TRIANGULATION STATIONS.

Creede and Del Norte quadrangles.

MINERAL, RIO GRANDE, AND SAGUACHE COUNTIES.

During the season of 1914 J. R. Ellis extended triangulation northeast from stations Belleview and South River, described in Bulletin 440. Four stations were occupied and seven points were located by intersections, all on North American datum.

BARN, RIO GRANDE COUNTY, COLO. (Not occupied.)

South end of barn about 6 miles northwest of Del Norte.

[Latitude 37° 41′ 54.48″. Longitude 106° 26′ 05.20″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Del Norte		223 06 33	4.21825	10.271
East Butte	238 56 18	58 59 29	3.95097	5.550
Dog	322 48 10	142 51 26	4.11416	8.082

BELLEVIEW, RIO GRANDE COUNTY, COLO.

Situated on east end of Belleview Mountain, locally known as North Mountain, about 1 mile north of the nearly abandoned town of Summitville.

Station mark: A rock monument 7 feet base and 9 feet high, probably erected by the Wheeler Survey.

Reference mark: The point occupied by theodolite is a hole drilled in a large rock (cracked) in which is cemented a nail with the head projecting 0.25 inch and over which a rock monument 2 feet base and 3 feet high was erected. True bearing from station 227° 43′, distant 9.9 feet.

[Latitude 37° 27′ 02.48″. Longitude 106° 36′ 14.98″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Summit	36 23 20.74	216 19 59.08	4.1390418	.....
Pagosa	89 06 35.64	268 49 43.89	4.6118040	.....
South River	112 28 06.51	292 14 20.07	4.5567810	.....
Del Norte	193 15 16.41	13 16 46.77	4.2007172	9.864
Bennett	256 24 49.58	76 31 02.92	4.1906878	9.639

BENNETT, RIO GRANDE COUNTY, COLO.

Situated in the highest part of Bennett Peak and at the headwaters of San Francisco Creek.

Signal: A cairn 4.5 feet base by 6.5 feet in height.

Station mark: A bronze tablet set in rock under center of cairn.

[Latitude 37° 29′ 00.24″. Longitude 106° 26′ 01.25″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Belleview	76 31 02.92	256 24 49.58	4.1906878	9.639
South River	101 55 42.71	281 35 42.09	4.6940039	30.715
Del Norte	136 00 50.46	315 56 06.92	4.2159060	10.215
East Butte	194 51 25.54	14 54 33.85	4.4692850	18.308
Observatory	197 28 28.00	.....	4.34010	13.597
Chimney	209 19 48.00	.....	4.44964	17.498
Dog	209 53 36.70	29 56 49.63	4.1926261	9.682
Center	224 05 53.00	.....	4.62204	26.025
Red Silo	226 30 21.00	.....	4.45018	17.520
White Silo	211 07 06.00	.....	4.59736	24.587

CENTER, SAGUACHE COUNTY, COLO. (Not occupied.)

West end of yellow elevator at Center.

[Latitude 37° 45′ 14.10″. Longitude 106° 06′ 10.73″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Bennett	.....	224 05 54	4.62201	26.023
Dog	52 25 43	232 16 49	4.43209	16.805
East Butte	85 58 18	265 49 18	4.33541	13.451

CHIMNEY, RIO GRANDE COUNTY, COLO. (Not occupied.)

Chimney on new house 5 or 6 miles northeast of Del Norte and 0.25 mile north of main irrigation ditch.

[Latitude 37° 42′ 16.14″. Longitude 106° 16′ 38.14″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Dog	28 43 47	208 41 16	4.09962	7.816
Bennett	.....	209 19 48	4.44964	17.498
East Butte	122 17 57	302 15 21	3.86766	4.542

DEL NORTE, RIO GRANDE COUNTY, COLO.

Situated on the highest point of Del Norte Peak and about 14 miles southwest of Del Norte town. A wagon road leads from Del Norte to Hogback Mesa, from which the station may be reached by horseback.

Signal: A cairn 5 feet base by 6 feet in heigh.

Station mark: A bronze tablet set in solid rock under center of cairn.

[Latitude 37° 35′ 23.67″. Longitude 106° 33′ 46.62″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Belleview	13 16 46.77	193 15 16.41	4.2007172	9.864
South River	87 25 24.82	267 10 06.59	4.5679884	22.979
South end of barn	223 06 33	.....	4.21825	10.271
East Butte	228 39 04.67	48 46 57.57	4.4021214	15.685
Chimney	243 08 46	.....	4.45086	17.557
Observatory	243 13 48	63 21 16	4.30393	12.511
Center	245 41 54	.....	4.64816	27.638
Dog	264 54 57.23	85 02 54.33	4.2845837	11.966

DEL NORTE OBSERVATORY, RIO GRANDE COUNTY, COLO. (Not occupied.)

Center of dome of observatory on low hill on south edge of Del Norte.

[Latitude 37° 40′ 17.18″. Longitude 106° 21′ 33.11″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Bennett	17 31 12	197 28 28	4.34010	13.597
Del Norte	63 21 16	243 13 48	4.30393	12.511
East Butte	.....	7 25 27	3.88479	4.766

DOG MOUNTAIN, RIO GRANDE COUNTY, COLO.

Situated on the highest point of Dog Mountain, a sharp peak about 6 miles due south of Del Norte.

Signal: A cairn 5 feet base by 6 feet in height.

Station mark: A bronze tablet set in solid rock under center of cairn.

[Latitude 37° 36′ 18.31″. Longitude 106° 20′ 44.64″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Bennett	29 56 49.63	209 53 36.70	4.1926261	9.682
Del Norte	85 02 54.33	264 54 57.23	4.2845837	11.966
South end of barn	142 51 26	322 48 10	4.11416	8.082
East Butte	179 14 42.70	359 14 37.77	4.1752526	9.303
Chimney	208 41 16	28 43 47	4.09962	7.816
White Silo	211 58 03	32 03 21	4.37998	14.905
Center	232 16 49	52 25 43	4.43209	16.805
Red Silo	245 07 32	65 12 48	4.14586	8.694
Monte Vista	279 06 49	99 15 17	4.31578	12.857

EAST BUTTE, RIO GRANDE COUNTY, COLO.

Situated on the highest part of the eastmost of two buttes about 3.5 miles north of Del Norte. A wagon road runs north and south between the two buttes.

Signal: A rock cairn 4.5 feet base by 6 feet in height.

Station mark: A bronze tablet set in solid rock under center of cairn.

[Latitude 37° 44′ 23.86″. Longitude 106° 20′ 52.69″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Observatory	7 25 27	.....	3.88479	4.766
Bennett	14 54 33.85	194 51 25.54	4.4692850	18.308
Del Norte	48 46 57.57	228 39 04.67	4.4021214	15.685
South end of barn	58 59 29	238 56 18	3.95097	5.550
White Silo	247 21 20	67 26 43	4.14532	8.683
Center	265 49 18	85 58 18	4.33541	13.451
Chimney	302 15 21	122 17 57	3.86766	4.542
Red Silo	305 10 24	125 15 45	4.19784	9.779
Monte Vista	311 29 42	131 38 16	4.43996	17.112
Dog	359 14 37.77	179 14 42.70	4.1752526	9.303

MONTE VISTA, RIO GRANDE COUNTY, COLO. (Not occupied.)

Station mark: Center of chimney on sugar beet factory, 1 mile east of Monte Vista.

[Latitude 37° 34′ 31.20″. Longitude 106° 06′ 52.08″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Del Norte	.....	272 12 13	4.59825	24.638
Dog	99 15 17	279 06 49	4.31578	12.857
East Butte	131 38 16	311 29 42	4.43996	17.112

RED SILO, RIO GRANDE COUNTY, COLO. (Not occupied.)

About 7 miles northwest of Monte Vista.

[Latitude 37° 39′ 28.88″. Longitude 106° 12′ 06.77″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Bennett		226 30 21	4.45018	17.520
Dog	65 12 48	245 07 32	4.14586	8.694
Del Norte		256 32 53	4.51534	20.356
East Butte	125 15 45	305 10 24	4.19784	9.799

SOUTH RIVER, MINERAL COUNTY, COLO.

On the summit of South River Peak, situated at the head of Red Mountain Creek which enters the Rio Grande from the south at the bend in river about 12 miles southwest of creek, and is at the east side of the east branch of the creek. A road reaches the basin about 1 mile distant from the peak via Red Mountain Creek. From the terminus of this road a trail leads across the divide and to Pagosa Spring.

Station mark: A bronze tablet cemented in rock, over which a cairn 3½ feet in diameter and 6 feet high was erected.

[Latitude 37° 34′ 27.08″. Longitude 106° 58′ 52.17″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Pagosa	27 34 34.55	207 31 27.76	4.2119146	
Graham	76 22 58.54	256 08 33.20	4.5550681	
Pyramid	108 02 41.92	287 47 38.97	4.5811070	
Uncompahgre	142 41 50.92	322 24 10.27	4.8424016	
Bristol	165 05 40.79	345 02 58.99	4.4009798	
San Luis	185 30 42.19	5 32 33.17	4.6629397	
La Garita	197 54 21.81	17 59 30.83	4.6031924	
Ouray	214 58 56.69	35 26 54.26	5.0618017	
Del Norte	267 10 06.59	87 25 24.82	4.5679884	22.979
Bennett	281 35 42.09	101 55 42.71	4.6940039	30.715
Belleview	292 14 20.07	112 28 06.51	4.5567810	
Summit	314 27 34.07	134 37 57.63	4.5484071	

WHITE SILO, SAGUACHE COUNTY, COLO. (Not occupied.)

Center of a white silo about 10 miles northeast of Del Norte.

[Latitude 37° 47′ 18.04″. Longitude 106° 12′ 05.62″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Bennett		211 07 06	4.59736	24.587
Dog	32 03 31	211 58 03	4.37998	14.905
Del Norte		235 14 42	4.58827	24.078
East Butte	67 26 43	247 21 20	4.14532	8.683

Pagoda 30′ quadrangle.

MOFFATT, RIO BLANCO, AND ROUTT COUNTIES.

During the season of 1915 C. B. Kendall extended triangulation southeastward from stations Cedar and Williams. Five new primary stations were occupied, and eight secondary points were located by intersections. Positions are on approximate North American datum as derived from stations Morrison and Table Mound, Colo.,

through Wyoming triangulation. (See Bull. 551, pp. 79 to 88, inclusive.)

A, ROUTT COUNTY, COLO. (Not occupied.)

On same divide as Williams triangulation station and about 2.5 miles northwest of same. It can be best reached by following trail up the first canyon northwest of Pagoda post office on Williams Fork, near Mr. Hughes's residence and about 1 mile from the post office. Station is 0.5 mile northwest of point where this canyon heads. The greater part of the hill was cleared.

Signal: Pole quadripod with flags.

Station mark: Bench mark in 8 by 10 by 24 inch sandstone centered under signal.

[Latitude 40° 22′ 32.6″. Longitude 107° 24′ 18.2″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Sleepy Cat	21 19 52	201 15 06	4.45945	
Natural	128 52 18	308 49 40	3.86578	
Cedar	142 28 04	322 20 11	4.44945	
Buck	149 31 51	329 30 01	3.90148	
Williams	307 34 03	127 35 28	3.59638	

BAEIRL, ROUTT COUNTY, COLO.

On divide between Dry Creek on the west and Sage Creek on the east. Station is about 1 mile southwest of the highest part on the divide known as Williams Fork Mountain and is about 1 mile west of point where the road leading from Hayden up Sage Creek crosses the divide between that creek and Willow Creek, about 3.5 miles northwest of Dunkley post office. Follow road from Hayden to Dunkley up Sage Creek until Mr. John Baierl's house is reached, which is the last house on Sage Creek, go through his fields and follow right-hand road to foot of hill, then by cow trails to the top. Station will be found on the highest point of hill due west of Mr. Baierl's house, about 1 mile.

Signal: A pole quadripod with flags.

Station mark: Standard bench mark tablet set in stone 8 by 8 by 24 inches under center of signal.

[Latitude 40° 21′ 27.52″. Longitude 107° 13′ 24.90″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Sage Willow	26 37 08	206 36 27	3.52503	
Williams	88 11 07.00	268 05 29.84	4.0896743	
Buck	114 36 29.69	294 27 35.12	4.3300629	
Hayden	161 15 00.05	341 12 10.37	4.2823334	
Twenty Mile	234 20 52.26	54 25 58.26	4.1366669	
Pinnacle	315 58 43.90	136 04 49.14	4.2835827	

BUCK, ROUTT COUNTY, COLO.

On the highest part of the mountain locally known as Buck Mountain. It is on the divide between Yampa River and Williams Fork of White River and 8 miles southeast of the town of Craig. The road from Hayden south by way of Deals Gulch to Williams Fork passes 3.5 miles west of the station, but as the country is fenced it can be best reached by road from Craig to Breeze Valley settlement, where a second-class road branches off and passes about 1 mile northeast of station. Leave this road at any convenient point and follow cow trails to summit of ridge and along ridge to top.

Signal: A pole quadripod with flags.

Station mark: A standard bench mark tablet in solid rock under signal.

[Latitude 40° 26′ 15.38″. Longitude 107° 27′ 09.74″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Geologist	6 29 52	186 29 04	4.19195	
Sleepy Cat	10 46 44	190 43 49	4.53544	
Natural	36 28 21	216 27 35	3.44940	
Cabin	65 25 32	245 23 17	3.73062	
Cedar	139 39 41	319 33 39	4.30675	
Hayden	235 02 14.68	55 08 20.32	4.2089395	
Fire House	248 19 25	68 27 09.15	4.25119	
Baeirl	294 27 35.12	114 36 29.69	4.3300629	
Williams	322 15 53.73	142 19 10.84	4.0692085	
A	329 30 01	149 31 51	3.90148	
Spruce	341 19 31	161 22 44	4.33920	

CABIN, MOFFATT COUNTY, COLO. (Not occupied.)

Flag in tree about 0.5 mile east of road from Craig to Deals Gulch and near the head of Deals Gulch.

Signal and station mark: Flag.

[Latitude 40° 25′ 02.8″. Longitude 107° 30′ 37.2″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log, meters.*	*Miles.*
Buck	245 23 17	65 25 32	3.73062	
Williams	300 12 37	120 18 08	4.14522	
Cedar	155 00 56	334 57 08	4.29005	

CEDAR, MOFFATT COUNTY, COLO.

On highest point of Cedar Mountain, a well-known hill about 7 miles northwest of Craig. Animals can be ridden to summit.

Signal: A cairn 7 feet high.

Station mark: A triangulation tablet under center of cairn.

[Latitude 40° 34′ 35.71″. Longitude 107° 36′ 27.43″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Devils Hole (U)	29 40 13.49	209 28 52.15	4.7012426	31.232
Brush (U)	34 00 36.95	213 48 36.74	4.6718142	29.185
Juniper (U)	68 28 35.29	248 12 10.27	4.5844446	23.867
Baker (U)	198 38 10.87	18 44 07.78	4.6024983	24.880
Welba (U)	222 04 07.88	42 13 42.22	4.4890545	19.160
Bears Ears (U)	233 33 32.06	53 47 34.48	4.5760526	23.410
Hahn (U)	242 30 38.17	62 57 11.84	4.8097394	40.095
Pilot (U)	258 56 47.41	79 16 34.58	4.6400562	27.127
Williams (U)	320 30 48.08	140 40 07.40	4.5049183	19.873
Pagoda (U)	334 12 03.74	154 22 44.51	4.7309635	33.444
Peak (U)	339 06 05.51	159 14 59.33	4.7383091	34.014
Sleepy Cat (U)	352 08 11.08	172 11 16.70	4.6955362	30.824
Hayden (K)	283 04 21.88	103 16 30.59	4.432′879	
Baeirl (K)	306 36 50.99	126 51 48.25	4.6089923	
Williams (K)	320 30 48.08	140 40 07.40	4.5049183	
A (K)	322 20 11	142 28 04	4.44945	
Natural (K)	327 01 45	147 07 00	4.32398	
Cabin (K)	334 57 08	155 00 56	4.29005	

NOTE.—U = values obtained by C. F. Urquhart in 1910; K = values obtained by C. B. Kendall in 1915.

HAYDEN FIRE HOUSE, ROUTT COUNTY, COLO. (Not occupied.)

In the town of Hayden, on the south side of the Moffat railroad, about 1,000 feet east of station. City fire and waterworks pumping station.

Signal and station mark: Smokestack in center of building.

[Latitude 40° 29′ 48.3″. Longitude 107° 15′ 26.0″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Williams	30 45 49	210 41 30	4.26561	
Buck	68 27 09	248 19 25	4.25119	

GEOLOGIST, MOFFATT COUNTY, COLO. (Not occupied.)

A geologist's flag on sandy, partly bare hill, about 5 miles south of the mouth of Deals Gulch and 5.5 miles southwest of Pagoda post office, on the divide between Williams River and Badger Gulch.

Signal and station mark: Flag in tree.

[Latitude 40° 17′ 54.2″. Longitude 107° 28′ 24.3″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Buck	186 29 04	6 29 52.4	4.19195	
Williams	235 18 34	55 22 40	4.03620	

GNAT, ROUTT COUNTY, COLO. (Not occupied.)

On a low bare hill about 3 miles southeast of the Breeze Valley settlement, about 3 miles south of Yampa River, and 7 or 8 miles southwest of Hayden. The road from Breeze Valley to Hayden passes about three-quarters of a mile south of the station.

Signal and station mark: Cairn 6 feet high, in center of which was erected a flagpole.

[Latitude 40° 27′ 08.8″. Longitude 107° 23′ 27.7″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Williams	349 56 27	169 57 20	4.04512	
Buck	72 32 59	252 30 35	3.73928	
Hayden	226 30 58	46 34 40	4.04412	
Baeirl	306 27 56	126 34 27	4.24765	

HAYDEN, ROUTT COUNTY, COLO.

On a ridge about 2 miles northwest of Hayden. The public road from Hayden north to the Elkhead country passes 0.8 mile east of the station; keep this road to top of ridge, where a gate will be found and a second-class road to the northeast; keep this road to point near top of small rise, then turn south and follow a wire fence. Station is about 200 yards southwest of point where this fence makes a sharp angle to the northwest.

Signal: A quadripod of sawed lumber with flags.

Station mark: An 8 by 8 by 24 inch sandstone block with a bench-mark tablet centered under signal.

[Latitude 40° 31′ 15.56″. Longitude 107° 17′ 46.50″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Williams	18 15 22.89	198 12 34.84	4.2904203	
Buck	55 08 20.32	235 02 14.68	4.2089395	
Cedar	103 16 30.59	283 04 21.88	4.4327879	
Twenty Mile	300 23 06.37	120 31 02.70	4.3021408	
Baeirl	341 12 10.37	161 15 00.05	4.2823334	

NATURAL, MOFFATT COUNTY, COLO. (Not occupied.)

On a sharp rise in ridge between Deals Gulch and first canyon to the east and about 2 miles southwest of Buck triangulation station.

Signal and station mark: Flag in tree.

[Latitude 40° 25′ 02.0″. Longitude 107° 28′ 20.7″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Cedar	147 07 00	327 01 45	4.32398	
Buck	216 27 35	36 28 21	3.44940	
A	308 49 40	128 52 18	3.86578	

PINNACLE, ROUTT COUNTY, COLO.

On Pinnacle Mountain, on divide between Trout Creek on the north and Oak Creek on the south. Peak is well known, being very sharp and well defined. The road from Dunkley via Pinnacle to Yampa and Oak Creek passes around the mountain on the south. There are numerous ways of ascending the Pinnacle, but one had better inquire the way as the fences are constantly being changed and a gap or gate would be more convenient, or meadows are apt to be flooded and impassable. Pinnacle school house is on the road 0.8 mile southwest of station. Animals were ridden to the top by going along the north and east slopes.

Signal: A pole quadripod with flags.

Station mark: Bench-mark tablet in solid rock centered under signal. Over mark was built a rock cairn 4 feet high.

[Latitude 40° 13′ 59.22″. Longitude 107° 04′ 00.13″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Williams	117 44 27.61	297 32 45.64	4.4615160	
Baeirl	136 04 49.14	315 58 43.90	4.2835827	
Twenty Mile	174 17 09.10	354 16 09.20	4.3406890	

SAGE WILLOW, ROUTT COUNTY, COLO. (Not occupied.)

No description available,

[Latitude 40° 19′ 50.4″. Longitude 107° 14′ 28.4″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Williams	103 34 27	283 29 27	4.04525	
Baeirl	206 36 27	26 37 08	3.52503	

SPRUCE, ROUTT COUNTY, COLO. (Not occupied.)

On or near the west end of east and west ridge on divide between the waters of Williams Fork and Willow Creek, about 7 miles southeast of Pagoda post office.

Signal and station mark: A tall very prominent spruce tree.

[Latitude 40° 15′ 04.6″. Longitude 107° 22′ 13.9″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Buck	161 22 44	341 19 32	4.33920	
Williams	180 58 54	0 59 00	4.05742	

TWENTY MILE, ROUTT COUNTY, COLO.

On the highest point of divide between Grassy Creek on the west, Fish Creek on the southeast, and Yampa River on the north. Station overlooks the Twenty-mile Park and is about 4 miles southeast of Harris on the Moffat railroad. The road from Hayden and Harris up Grassy Creek passes about 3 miles west of the station; leave this road near the 10-mile post to Hayden and follow second-class road through what is locally known as the Forest Culture. Keep this road till an old deserted house is reached about 1.25 miles from main road. Follow woods roads leading from the house east up a canyon or continue south through pasture until a large canyon to east is reached. An old road leads up this canyon about 2 miles. Wagon was taken to a point about 1 mile north of station, thence the top was reached by saddle along cow trails.

Signal: Pole quadripod with flags.

Station mark: Bench-mark tablet in 8 by 10 by 24 inch sandstone block centered under signal.

[Latitude 40° 25′ 46.10″. Longitude 107° 05′ 32.69″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Baeirl	54 25 58.26	234 20 52.26	4.1366667	.....
Williams	70 24 34.93	250 13 51.52	4.3956787	.....
Hayden	120 31 02.70	300 23 06.37	4.3021408	.....
Pinnacle	354 16 09.20	174 17 09.10	4.3406890	.....

WILLIAMS, ROUTT COUNTY, COLO.

On about highest point of divide between Bear River and Williams River, on a line between Hayden and Pagoda post office. It is about 4.5 miles northeast from Pagoda and 10 or 12 miles from Hayden. Animals can be ridden to station from either place and the signal can be seen from Hayden, but not from Pagoda.

Signal: A quaking asp tree securely supported by poles.

Station mark: A triangulation tablet set in rock at base of tree.

[Latitude 40° 21′ 14.57″. Longitude 107° 22′ 05.58″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Peak (U)	1 54 40.73	181 54 16.65	4.4227248	16.447
Sleepy Cat (U)	29 08 43.55	209 02 31.96	4.4465285	17.373
Devils Hole (U)	67 22 31.70	247 01 54.86	4.6905796	30.474
Brush (U)	73 09 13.08	252 47 57.21	4.6878817	30.285
Juniper (U)	100 51 07.55	280 25 26.18	4.7563393	35.456
Cedar (U)	140 40 07.40	320 30 48.08	4.5049183	19.873
Welba (U)	180 32 39.95	0 32 52.49	4.6773808	29.562
Bears Ears (U)	192 07 02.50	12 11 42.54	4.6822060	29.892
Pilot (U)	214 24 37.96	34 35 02.69	4.6019532	24.849
Pagoda (U)	352 45 29.34	172 46 51.82	4.3797352	14.897
Spruce (K)	0 59 00	180 58 54	4.05747	.....
Geologist (K)	55 22 40	235 18 34	4.03620	.....
Cabin (K)	120 18 08	300 12 37	4.14522	.....
A (K)	127 35 28	307 34 03	3.59638	.....
Cedar (K)	140 40 07.40	320 30 48.08	4.5049183	.....
Buck (K)	142 19 10.84	322 15 53.73	4.0692085	.....
Hayden (K)	198 12 34.84	18 15 22.89	4.2904203	.....
Fire House (K)	210 41 30	30 45 49	4.26561	.....
Twenty Mile (K)	250 13 51.52	70 24 34.93	4.3956787	.....
Baeirl (K)	268 05 29.84	88 11 07.00	4.0896743	.....
Sage Willow (K)	283 29 27	103 34 27	4.04525	.....
Pinnacle (K)	297 32 45.64	117 44 27.61	4.4615160	.....

NOTE.—U=values obtained by C. F. Urquhart in 1910; K=values obtained by C. B. Kendall in 1915.

COLORADO AND UTAH.

TRIANGULATION STATIONS.

Cameo, Coventry, Delta, Gateway, Grand Junction, Lone Cone, Mount Peale, Mount Waas, and Naturita quadrangles.

DELTA, GARFIELD, HINSDALE, MESA, MONTROSE, AND SAN MIGUEL COUNTIES, COLO.; GRAND AND SAN JUAN COUNTIES, UTAH.

During the season of 1914 C. F. Urquhart extended triangulation east and south from Coast and Geodetic Survey primary stations Tavaputs and Mount Waas, and secondary stations Chiquita, Mesa, and Mams Peak. He occupied 15 new stations and located 7 points by intersections, the positions for which are on North American datum.

CHIQUITA, MESA COUNTY, COLO.

Described by United States Coast and Geodetic Survey in Special Publication 19. About 12 miles south-southwest from Grand Junction, on the northern rim or brow of Piñon Mesa. The station is marked by a low brick pier used in mounting the instrument.

[Latitude 38° 54′ 38.264″. Longitude 108° 39′ 06.632″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Glade	139 27 36.64	319 24 09.67	4.0859796	7.574
Piñon	154 19 42.96	334 16 06.20	4.2814780	11.880
Tavaputs	156 30 45.30	336 17 20.60	4.8822167	47.377
Indian	211 41 17.58	31 45 53.81	4.3030700	12.486
Ray	215 14 16.30	35 32 32.34	4.8568205	44.686
Grand	245 38 46.06	65 53 49.24	4.5786049	23.548
Mesa	271 26 06.85	91 43 56.10	4.6131895	25.500
Uncompahgre	311 30 37.28	132 15 04.29	5.1444994	86.666

COKE, MONTROSE COUNTY, COLO.

Station is on a rather prominent hill covered with cedar and piñon trees about 3 miles southwest of the coke ovens on road between Naturita and Paradox. It is just above and on the north side of Basin Creek Canyon. Can be reached on horseback from the coke ovens or from the Wheeler & Lavender ranch, known as the Spectacle ranch. Better traveling from the latter, but about 6 miles farther.

Signal: A cairn 6 feet high on highest point of peak.

Station mark: A bronze tablet set in solid rock under center of cairn.

[Latitude 38° 11′ 17.269″. Longitude 108° 40′ 20.549″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Blue Mountain	61 05 52.13	240 36 41.28	4.8998385	49.339
Gypsum	72 19 35.21	252 13 37.64	4.1698860	9.188
Mount Peale	119 55 09.93	299 34 28.33	4.7484857	34.821
Mount Waas	128 57 37.33	308 36 57.41	4.7939472	38.663
Pace	138 11 21.95	317 56 18.70	4.7231679	32.849
Skinout	142 58 46.23	322 48 38.46	4.5961040	24.516
Montpelier	182 57 25.65	2 58 22.82	4.6355230	26.846
Tree	208 27 34.02	28 33 53.35	4.4933578	19.351
Nucla	229 46 36.30	49 51 18.46	4.1618449	9.020
Uncompahgre	276 33 43.92	97 18 35.28	4.0291535	66.451
Lone Cone	312 08 09.61	132 23 35.53	4.6947394	30.767
Young	321 31 38.32	141 36 34.15	4.2736658	11.669
North Mountain	322 14 44.62	142 24 44.54	4.5892113	24.130
Lavender	329 29 48.92	149 36 30.98	4.4964885	19.491

FIR, MESA COUNTY, COLO.

On about the highest point of a flat-topped peak in the Fruita Reserve, on the summit of Piñon Mesa. It is about 5 miles north of Mr. Silzell's ranch, in Unaweep Canyon, and can be reached from there by trail. The flat ridge east of peak can not be seen over and is probably a little higher, but can not be used for station on account of dense growth of timber. There is a road from Glade Park post office to foot of peak.

Signal and station mark: A spruce or fir tree about 50 feet high, trimmed up.

Reference mark: A triangulation tablet set in rock 81.5 feet from tree.

True azimuth tree to tablet: 238° 23′.

[Latitude 38° 49′ 44.524″. Longitude 108° 48′ 10.768″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Pace	36 53 34.28	216 43 18.57	4.5992107	24.692
Mount Waas	49 04 18.25	228 48 23.50	4.6898898	30.426
Tavaputs	167 34 29.77	347 26 49.56	4.9076281	50.232
Piñon	190 20 45.25	10 22 50.72	4.4268648	16.604
Spruce	191 16 24.91	11 23 09.84	4.8938909	48.668
Ray	218 45 55.97	39 09 54.47	4.9397753	54.091
Mams or North Mam	323 20 17.97	52 55 46.53	4.0086546	63.388
Grand	242 31 43.43	62 52 27.81	4.7296484	33.343
Uncompahgre	305 15 14.16	126 05 17.16	5.1587892	89.565
Montpelier	334 03 47.58	154 09 39.18	4.4930338	19.337

GLADE, MESA COUNTY, COLO. (Not occupied.)

Station mark and signal: Cupola on schoolhouse at Glade Park post office, on Piñon Mesa, 18 miles from Grand Junction.

[Latitude 38° 59′ 38.534″. Longitude 108° 44′ 35.849″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Piñon	177 21 21.17	357 21 11.53	3.9018469	4.957
Chiquita	319 24 09.67	139 27 36.64	4.0859796	7.574

GRAND, MESA COUNTY, COLO.

Station is near northwest corner of Grand Mesa and built near rim rock. A very short distance can be seen in country between Ray and Mesa.

Station mark: A triangulation tablet set under center of cairn 9 feet high.

[Latitude 39° 03′ 02.597″. Longitude 108° 15′ 10.867″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Lone Cone	0 04 34.35	180 04 30.00	5.1107742	80.191
Tree	17 40 09.55	197 30 47.70	4.8557726	44.578
Montpelier	33 09 11.40	212 54 22.87	4.7975940	38.989
Mount Waas	56 27 17.54	235 50 39.97	5.0082586	63.330
Fir	62 52 27.81	242 31 43.43	4.7296484	33.343
Chiquita	65 53 49.24	245 38 46.06	4.5786049	23.548
Piñon	92 23 52.46	272 05 10.68	4.6318248	26.618
Indian	93 45 44.97	273 35 16.94	4.3804724	14.922
Tavaputs	130 09 56.19	309 41 20.97	4.9275225	52.586
Spruce	148 31 53.36	328 17 45.60	4.7871970	38.067
Ray	189 26 00.89	9 29 10.24	4.6401779	27.135
Mesa	338 55 47.42	158 58 35.20	4.2523450	11.110

GYPSUM, SAN MIGUEL COUNTY, COLO.

Near the San Miguel and Montrose county line, and near the west end of Dry Creek basin, 10 or 11 miles west of the Wheeler & Lavender "Spectacle ranch." The only available water is at this ranch. There is a wagon road through Dry Creek basin to foot of ridge on which station is located. Very easy to reach on horseback.

Signal: A piñon tree braced up by small cairn and poles.

Station mark: A triangulation tablet set in solid rock under center of signal.

[Latitude 38° 08′ 51.270″. Longitude 108° 49′ 59.175″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Blue Mountain	58 27 29.46	238 04 15.60	4.8126661	40.366
Mount Peale	133 09 13.86	312 54 31.39	4.6752488	29.417
Pace	154 10 05.81	334 01 01.94	4.6877436	30.276
Skinout	164 51 58.94	344 47 50.14	4.5713203	23.156
Montpelier	198 48 35.46	18 55 31.72	4.7020262	31.288
Coke	252 13 37.64	72 19 35.21	4.1698860	9.188
Uncompahgre	273 34 39.57	94 25 26.82	5.0812755	74.925
Young	291 31 02.80	111 41 55.54	4.4428244	17.226
Lone Cone	299 23 16.11	119 44 37.99	4.7661750	36.268
North Mountain	304 35 43.36	124 51 39.48	4.6632763	28.617
Lavender	306 48 22.67	127 01 01.15	4.5743960	23.321

INDIAN, MESA COUNTY, COLO.

Water tank at abandoned Indian school about 2 miles east of Grand Junction.

Station mark: A pipe extending into the ground under center of tank. A rock with triangulation tablet set in it was placed in ground 2.4 feet from pipe.

True azimuth pipe to tablet: 238° 11′.

[Latitude 39° 03′ 52.516″. Longitude 108° 31′ 47.585″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Chiquita	31 45 53.81	211 41 17.58	4.3030700	12.486
Piñon	90 29 01.90	270 20 48.09	4.2750492	11.706
Tavaputs	142 18 07.10	322 00 02.96	4.8250258	41.531
Grand	273 35 16.94	93 45 44.97	4.3804724	14.922
Mesa	300 49 28.16	121 02 42.99	4.5496652	22.030

LAVENDER, SAN MIGUEL COUNTY, COLO.

On north rim of steep bluff overlooking the Wheeler & Lavender ranch (Desert claim). There is a wagon road from Narutita or Norwood to this ranch. Animals can be ridden from ranch to station. Distance about 3 miles.

Signal: An aspen tree braced by poles.

Station mark: A triangulation tablet set in rock at center of signal.

NOTE.—This station should not be used for extending triangulation, as its position is not very accurate.

[Latitude 37° 56′ 40.182″. Longitude 108° 29′ 28.462″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Gypsum	127 01 01.15	306 48 22.67	4.5743960	23.321
Coke	149 36 30.98	329 29 48.92	4.4964885	19.491
Young	161 07 54.43	341 06 07.99	4.1150605	8.099
North Mountain	295 11 46.10	115 15 03.56	3.9381745	5.389

LEON, DELTA-MESA COUNTY LINE, COLO.

On summit of Leon Peak on the Delta-Mesa county line. A well-known peak at the head of Big Creek, about 11 miles south and 6 miles east of Collbron station, is in T. 11 S., R. 94 W., near east edge of sec. 24, and can be easily reached by wagon road from Collbron up Big Creek via Big Creek ranger station to sawmill, thence by ranger's trail to summit. Animals can be ridden to foot of peak about 0.25 mile northwest of summit. Good feed and water.

Signal: Center of cupola of Forest Service lookout house.

Station mark: A standard bronze tablet set in large bowlder under center of cupola of Forest Service lookout house 10 feet square. House built of wood and tin and painted white.

[Latitude 39° 04′ 46.864″. Longitude 107° 50′ 37.173″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Montpelier	51 34 42.85	231 04 30.03	4.9510016	55.508
Mount Waas	63 54 32.75	243 02 30.82	5.1281457	83.463
Tavaputs	117 23 25.93	296 39 16.54	5.0510402	69.886
Spruce	126 15 03.97	305 45 22.51	4.9206805	51.764
Ray	144 51 59.03	324 39 35.84	4.6884371	30.324
Mams	176 49 08.25	356 48 18.18	4.5332803	21.214

LONE CONE, SAN MIGUEL-DOLORES COUNTY LINE, COLO. (Not occupied.)

Station and signal is a small cairn on summit of Lone Cone, a very prominent peak in southeastern part of San Miguel County.

[Latitude 37° 53′ 17.156″. Longitude 108° 15′ 17.892″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
North Mountain	101 15 28.36	281 10 03.22	4.1200279	8.192
Gypsum	119 44 37.99	299 23 16.11	4.7661750	36.268
Young	126 44 45.32	306 34 15.62	4.4933102	19.349
Mount Waas	130 37 28.93	310 01 23.53	5.0480353	69.404
Coke	132 23 35.53	312 08 09.61	4.6947394	30.767
Pace	135 31 08.88	315 00 39.00	5.0096106	62.527
Nucla	149 12 56.30	329 02 10.73	4.6964660	30.890
Montpelier	155 57 07.85	335 42 34.89	4.9232069	52.066
Grand	180 04 30.00	0 04 34.35	5.1107742	80.191
Mesa	183 21 35.98	3 24 26.01	5.0514019	69.944

MAMS PEAK OR NORTH MAM, GARFIELD COUNTY, COLO.

On summit of the North Mam Peak, the highest point of the Battlement Mesa, about 10 miles south and 5 miles west of Rifle, from which point it can be easily reached by wagon road up Beaver Creek to Fondett's ranch and thence by trail till peak first shows on the right. The best way from this point is to turn nearly north and approach the peak from the northeast side. Animals can be ridden to foot of peak on northeast side about 0.25 mile from summit.

Signal: A cairn 6 feet high with 10-foot pine pole in center.

Station mark: A bronze tablet set in stone and placed in crevice of rock and over which was built a cairn 6 feet high.

[Latitude 39° 23′ 12.259″. Longitude 107° 51′ 56.336″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Mount Waas	51 52 12.76	231 00 50.17	5.1787597	93.780
Fir	52 55 46.53	232 20 17.97	5.0086546	63.388
Tavaputs	100 12 10.38	279 28 42.67	4.9980190	61.854
Ray	102 31 10.88	282 19 35.52	4.4286119	16.671
Spruce	103 04 14.03	282 35 17.06	4.8262464	41.648
Leon	356 48 18.18	176 49 08.25	4.5332803	21.214

MAMS PEAK, GARFIELD COUNTY, COLO.

[Location from Pelham, Hahn, and Bridger: Latitude 39° 23′ 11.71″; longitude 107° 51′ 55.98″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Lincoln	56 35 58.74	236 17 30.75	4.7021508	31.297
Meade	84 08 20.72	263 50 06.11	4.6184718	25.812
Ray	102 31 36.59	282 20 00.98	4.4287787	16.677
Cathedral	123 01 08.21	302 34 59.83	4.8447632	43.462
Colorow	163 13 42.67	343 01 42.27	4.9652048	57.353
Petrolite	167 58 25.44	347 53 01.05	4.7632344	36.023
Rio Blanco	173 20 40.76	353 18 45.36	4.5710313	23.141
Sleepy Cat	199 06 35.44	19 19 32.69	4.9439031	54.608

MESA, DELTA COUNTY, COLO.

Described by United States Coast and Geodetic Survey in Special Bulletin 19.

A short distance north of the most western point of that part of the Grand Mesa which is southeast of Connah Creek, within about 40 feet of the edge of the rim rock which limits the mesa.

Station mark: A copper bolt set in the solid lava rock. It is also marked about 10 inches above the ground by a drill hole in a brick embedded in the masonry which fills the space between the bases of the three small brick piers used to support the instrument.

[Latitude 38° 54′ 01.482″. Longitude 108° 10′ 44.122″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Lone Cone	3 24 26.01	183 21 35.98	5.0514019	69.944
Tree	28 40 17.42	208 28 09 82	4.7698873	36.580
Montpelier	48 42 07.69	228 24 33.68	4.7345514	33.721
Mount Waas	66 35 42.37	245 56 21.53	4.9982566	61.888
Chiquita	91 43 56.10	271 26 06.85	4.6131895	25.500
Piñon	110 37 05.64	290 15 37.86	4.7208265	32.672
Indian	121 02 42.99	300 49 28.16	4.5496652	22.030
Tavaputs	135 06 52.16	314 35 30.99	5.0029038	62.554
Grand	158 58 35.20	338 55 47.42	4.2523450	11.110
Uncompahgre	325 32 34.11	145 59 21.22	5.0463212	69.131

MONTPELIER, MESA COUNTY, COLO.

Station is on ridge known as Uncompahgre Plateau, which divides the waters of Dolores and Gunnison rivers, and south of the Unaweep Canyon. It can be reached by going from Whitewater, a station on the Denver & Rio Grande Railroad, on Gateway road, to source of East Creek, thence up Kelly's dugway to summit of ridge; thence on road to the U. C. C. cattle ranch at source of Mesa Creek. Signal can be seen about 2 miles south of this place. Station is on prominent mountain with aspen trees around the sides; trees cut from the summit. The mountain is sometimes called Uncompahgre Butte.

Signal: A rock cairn 7 feet high.

Station mark: A triangulation tablet under center of cairn.

[Latitude 38° 34′ 36.583″. Longitude 108° 38′ 48.473″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Coke	2 58 22.82	182 57 25.65	4.6355230	26.846
Gypsum	18 55 31.72	198 48 35.46	4.7020262	31.288
Blue Mountain	41 21 55.73	220 51 40.31	5.0358104	67.478
Mount Peale	73 21 47.74	253 00 03.49	4.7244604	32.947
Pace	84 18 42.82	264 02 38.31	4.5758634	23.400
Mount Waas	85 28 23.76	265 06 41.15	4.7056158	31.548
Fir	154 09 39.18	334 03 47.58	4.4930338	19.337
Ray	203 12 07.95	23 30 08.63	5.0179456	64.758
Grand	212 54 22.87	33 09 11.40	4.7975940	38.989
Mesa	228 24 33.68	48 42 07.69	4.7345514	33.721
Leon	231 04 30.03	51 34 42.85	4.9510016	55.508
Uncompahgre	298 02 27.24	118 46 33.14	5.0712622	73.217
Tree	321 21 35.76	141 26 59.39	4.3051468	12.546
Lone Cone	335 42 34.89	155 57 07.85	4.9232069	52.066
North Mountain	343 44 56.88	163 54 02.41	4.8860936	47.802

NORTH MOUNTAIN, SAN MIGUEL COUNTY, COLO.

On high mountain, well known locally as North Mountain. It is about 7 or 8 miles southeast of the Wheeler & Lavender ranch known as the Desert claim, and 8 miles a little north of west from Lone Cone. It can be reached on horseback from almost any direction, but the best trail is probably from the above ranch.

Signal: An aspen tree left standing.

Reference mark: A tablet set in rock and placed in ground 3 feet from tree.

Azimuth tree to mark: 17° 16′.

[Latitude 37° 54′ 40.303″. Longitude 108° 24′ 07.194″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Blue Mountain	85 27 48.32	264 48 45.29	4.9712991	58.163
Lavender	115 15 03.56	295 11 46.10	3.9381745	5.389
Gypsum	124 51 39.48	304 35 43.36	4.6632763	28.617
Mount Waas	134 13 31.95	313 42 53.52	5.0017961	62.395
Pace	140 04 25.37	319 39 22.56	4.9620982	56.944
Coke	142 24 44.54	322 14 44.62	4.5892113	24.130
Young	143 05 05.88	323 00 01.77	4.3022892	12.463
Nucla	162 35 32.60	342 30 13.41	4.6236614	26.122
Montpelier	163 54 02.41	343 44 56.88	4.8860936	47.802
Tree	171 25 13.23	351 21 29.83	4.7691298	36.516
Lone Cone	281 10 03.22	101 15 28.36	4.1200279	8.192

NUCLA, MONTROSE COUNTY, COLO.

Tall flagpole at reservoir in the town of Nucla.

Station mark: A triangulation tablet set in rock at foot of flagpole.

Mark is near road and was used as a bench mark by levelman.

[Latitude 38° 16′ 21.046″. Longitude 108° 32′ 44.591″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Coke	49 51 18.46	229 46 36.30	4.1618449	9.020
Mount Waas	116 39 25.78	296 14 01.45	4.8227769	41.317
Pace	123 01 48.28	302 42 00.92	4.7420021	34.305
Tree	191 51 55.92	11 53 32.67	4.2646589	11.429
Lone Cone	329 02 10.73	149 12 56.30	4.6964660	30.890
North Mountain	342 30 13.41	162 35 32.60	4.6236614	26.122

PIÑON, MESA COUNTY, COLO.

Station is on a piñon and cedar ridge 5 miles north of Glade Park post office on Piñon Mesa. The post office is 18 miles from Grand Junction. The ridge is locally known as Black Ridge. Animals can be ridden to the point.

Signal and station mark: A piñon tree, 25 feet high, with lower limbs cut off.

Reference mark: A triangulation tablet set in solid rock, 6.95 feet from tree.

True azimuth, tree to tablet: 261° 31′.

[Latitude 39° 03′ 56.944″. Longitude 108° 44′ 51.156″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Fir	10 22 50.72	190 20 45.25	4.4268648	16.604
Mount Waas	35 38 26.38	215 20 24.09	4.8560394	44.606
Tavaputs	157 10 58.45	337 01 10.65	4.7569782	35.508
Spruce	191 47 19.51	11 51 59.06	4.7127074	32.067
Ray	230 06 58.67	50 28 54.51	4.8116412	40.271
Indian	270 20 48.09	90 29 01.90	4.2750492	11.706
Grand	272 05 10.68	92 23 52.46	4.6318248	26.618
Mesa	290 15 37.86	110 37 05.64	4.7208265	32.672
Chiquita	334 16 06.20	154 19 42.96	4.2814780	11.880
Glade	357 21 11.53	177 21 21.17	3.9018469	4.957

RAY, GARFIELD COUNTY, COLO.

Described in United States Geological Survey Bulletin 551.

On highest point of bald ridge, about 6 miles northeast (air line) from De Beque, a station on the Denver & Rio Grande Railroad. Station can be reached from De Beque by following road to C. H. Conwell's ranch (8 miles), thence by trail up Logan Gulch to its source, thence up mountain to its highest point. The distance from Conwell's to station is 10 miles.

Signal: A fir tree braced by poles.

Station mark: A triangulation tablet set in rock under center of signal.

[Latitude 39° 26′ 19.417″. Longitude 108° 10′ 11.566″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Grand	9 29 10.24	189 26 00.89	4.6401779	27.135
Montpelier	23 30 08.63	203 12 07.95	5.0179456	64.758
Chiquita	35 32 32.34	215 14 16.30	4.8568205	44.686
Fir	39 09 54.47	218 45 55.97	4.9397753	54.091
Piñon	50 28 54.51	230 06 58.67	4.8116412	40.271
Spruce	103 14 42.21	282 57 20.64	4.6042162	24.979
Mams or North Mam	282 19 35.52	102 31 10.88	4.4286119	16.671
Leon	324 39 35.84	144 51 59.03	4.6884371	30.324

POLITECHNIKA GDAŃSKA ZAKŁAD GEOLOGII

[Located from Pelham, Hahn & Bridger: Latitude 39° 26′ 19.05″; longitude 108° 10′ 11.60″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Grand	9 29 39.93	189 26 30.38	4.6402621	27.140
Lincoln	25 05 36.57	204 58 41.72	4.5694090	23.055
Low	31 52 23.65	211 49 22.59	4.1119505	8.041
Meade	56 09 54.42	236 03 14.52	4.2592310	11.287
Cathedral	134 40 09.26	314 25 38.15	4.6606689	28.446
Petrolite	195 19 03.38	15 25 18.18	4.7226619	32.810
Rio Blanco	214 52 47.20	35 02 29.81	4.5807534	23.665
Mams Peak	282 20 00.98	102 31 36.59	4.4287787	16.677
Red	317 31 03.60	137 36 14.95	4.2406675	10.815

SKINOUT, MONTROSE COUNTY, COLO. (Not occupied.)

Station mark and signal: A cone-shaped tree on highest point of Skinout Mountain on east side of Sinbad Valley. This valley can be reached by wagon road from Gateway on Dolores River.

[Latitude 38° 28′ 17.811″. Longitude 108° 56′ 40.521″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Mount Waas	107 01 48.22	286 51 14.56	4.4112776	16.019
Pace	124 21 07.42	304 16 11.49	4.1443393	8.663
Coke	322 48 38.46	142 58 46.23	4.5961040	24.516
Gypsum	344 47 50.14	164 51 58.94	4.5713203	23.156

SPRUCE, GARFIELD COUNTY, COLO.

On ridge at the source of Salt Wash and near the tributaries of Roan Creek. There is a round hill one-quarter mile N. 13° W., a little higher and more prominent, but a lone spruce tree on ridge was sighted from Ray and used as signal. All prominent points can be seen from point used.

To reach point from De Beque, go up Roan Creek to Highmore post office, thence up same creek to Mr. Burk's ranch, from which place a trail leads up to summit of cliffs, thence along ridge to source of Salt Wash. Station can be reached from any direction after getting on ridge.

Signal and station mark: A spruce tree 20 feet high.

Reference mark: A triangulation tablet.

True azimuth tree to mark: 218° 36′.

[Latitude 39° 31′ 14.865″. Longitude 108° 37′ 29.752″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Fir	11 23 09.84	191 16 24.91	4.8938909	48.668
Piñon	11 51 59.06	191 47 19.51	4.7127074	32.067
Tavaputs	93 50 53.62	273 36 22.02	4.5155340	20.365
Mams or North Mam	282 35 17.06	103 04 14.03	4.8262464	41.648
Ray	282 57 20.64	103 14 42.21	4.6042162	24.979
Leon	305 45 22.51	126 15 03.97	4.9206805	51.764
Grand	328 17 45.60	148 31 53.36	4.7871970	38.067

TAVAPUTS, GARFIELD COUNTY, COLO.

A United States Coast and Geodetic Survey station, described in Special Publication 19.

On the southern edge of the Book Mountains, which in this vicinity consist of low flat ridges sparsely covered with pine and aspen trees. The station is between West

Salt Wash, 3 miles to the southeast, and Bitter Creek, three-fourths mile to the west. Bitter Creek has its source in a fresh-water spring 1.25 miles distant to the north.

Station mark: Copper bolt in a drill hole in solid rock, under a brick in concrete.

Reference marks: At the following distances and azimuths from the station: 2.43 meters, 74° 41′; 2.40 meters, 196° 31′; and 2.43 meters, 322° 12′.

[Latitude 39° 32′ 23.946″. Longitude 109° 00′ 19.148″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Mount Waas	9 53 07.92	189 44 44.55	5.0520834	70.054
Spruce	273 36 22.02	93 50 53.62	4.5155340	20.365
North Mam or Mams	279 28 42.67	100 12 10.38	4.9980190	61.854
Leon	296 39 16.54	117 23 25.93	5.0510402	69.886
Grand	309 41 20.97	130 09 56.19	4.9275225	52.586
Mesa	314 35 30.99	135 06 52.16	5.0029038	62.554
Indian	322 00 02.96	142 18 07.10	4.8250258	41.531
Chiquita	336 17 20.59	156 30 45.30	4.8822171	47.377
Piñon	337 01 10.65	157 10 58.45	4.7569782	35.508
Fir	347 26 49.56	167 34 29.77	4.9076281	50.232

TREE, MONTROSE COUNTY, COLO. (Not occupied.)

Signal and station mark: A tree on prominent mountain on Uncompahgre Plateau 12.5 miles southeast of Montpelier station and 11.5 miles north-northeast of Nucla.

[Latitude 38° 26′ 04.805″. Longitude 108° 30′ 08.660″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Nucla	11 53 32.67	191 51 55.92	4.2646589	11.429
Coke	28 33 53.35	208 27 34.02	4.4933578	19.351
Mount Waas	100 37 48.25	280 10 44.16	4.8082458	39.957
Pace	103 36 20.07	283 14 53.55	4.7118665	32.005
Montpelier	141 26 59.39	321 21 35.76	4.3051468	12.546
Grand	197 30 47.70	17 40 09.55	4.8557726	44.578
Mesa	208 28 09.82	28 40 17.42	4.7698873	36.580
North Mountain	351 21 29.83	171 25 13.23	4.7691298	36.516

UNCOMPAHGRE, HINSDALE COUNTY, COLO.

Described in United States Coast and Geodetic Survey Special Publication 19.

On summit of Uncompahgre Peak on north side about 10 feet from edge of perpendicular cliff of which this side of mountain consists. The summit is inaccessible except from south side. Lake City, the terminus of a branch of the Denver & Rio Grande Railroad, leaving the main road at Sapinero, distant about 8 miles air line, southeast of peak, is nearest and most convenient railroad town.

Station mark: A crosscut in top of a half-inch copper bolt leaded into solid rock. The surface mark is a half-inch hole in a brick cemented into top of masonry foundation pier, for theodolite, built around and over station bolt. Top of brick is 4 inches above bolt. The usual circular stone ring wall, inner diameter 11 feet, concentric with station bolt, was left standing.

Reference marks: Consist of four drill holes in solid rock, filled with lead—one south 89° 58′ west, distant 9.35 feet; one north 0° 11′ west, distant 8.71 feet; one north 89° 56′ west, distant 9.4 feet; and one south 3° 37′ west, distant 8.12 feet, from the geodetic point. The brick latitude pier, bearing south 54° 05′ east, distant 50.11 feet, and the stone pendulum house, bearing south 28° 26′ east, distant 134.15 feet, were also left standing.

[Latitude 38° 04′ 18.387″. Longitude 107° 27′ 41.707″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Sneffels	75 32 46.6	255 20 34.1	4.4764217	.....
Gypsum	94 25 26.82	273 34 39.57	5.0812755	74.925
Coke	97 18 35.28	276 33 43.92	5.0291535	66.451
Horsefly	108 20 41.92	288 03 18.17	4.6368392	26.927
Mount Waas	109 07 06.12	288 01 25.77	5.2119946	101.238
Montpelier	118 46 33.14	298 02 27.24	5.0712622	73.217
Fir	126 05 17.16	305 15 14.16	5.1587892	89.565
Chiquita	132 15 04.29	311 30 37.28	5.1444994	86.666
Mesa	145 59 21.22	325 32 34.11	5.0463212	69.131
Castle Rock	150 27 16.65	330 20 45.12	4.4940878	19.384
Sapinero	192 30 48	12 35 11	4.67609	.....
Treasury Mountain	196 43 01.82	16 56 36.24	5.0387020	.....
Cebolla	206 29 35	26 38 28	4.67002	.....
Mount Ouray	249 49 54.38	70 35 52.02	5.0611148	.....
San Luis	281 16 05.02	101 35 42.15	4.6770430	.....
Lake	282 30 36.9	102 38 39.2	4.2813527	.....
La Garita	287 11 57.80	107 34 53.28	4.7568771	.....
Bristol	310 41 43.10	130 56 43.65	4.6746191	.....
South River	322 24 10.27	142 41 50.92	4.8424016	.....
Sherman	348 59 42.2	169 01 03.2	4.2261074	.....
Pyramid	351 57 49.33	172 00 23.20	4.6427600	.....
Agency	.....	.....	4.75408	.....

YOUNG, SAN MIGUEL COUNTY, COLO.

Windmill tower in C. B. Young's yard. Mr. Young's ranch is the only place of any consequence in Dry Creek basin and is about 13 miles south of Naturita.

Station mark: A triangulation tablet set in rock and placed 3 inches under the surface of the ground under the center of tower. (It is possible that another well may be bored and the tower moved a few feet.)

[Latitude 38° 03′ 20.162″. Longitude 108° 32′ 21.346″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Gypsum	111 41 55.54	291 31 02.80	4.4428244	17.226
Coke	141 36 34.15	321 31 38.32	4.2736658	11.669
Lone Cone	306 34 15.62	126 44 45.32	4.4933102	19.349
North Mountain	323 00 01.77	143 05 05.88	4.3022892	12.463
Lavender	341 06 07.99	161 07 54.43	4.1150605	8.099

BLUE MOUNTAIN, SAN JUAN COUNTY, UTAH. (Not occupied.)

This mountain is known as Blue Mountain, but called Abajo Peak on land office map. About the highest peak was located.

[Latitude 37° 50′ 22.968″. Longitude 109° 27′ 43.469″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Pace	203 17 26.62	23 31 44.60	4.9293889	52.813
Montpelier	220 51 40.31	41 21 55.73	5.0358104	67.478
Gypsum	238 04 15.60	58 27 29.46	4.8126661	40.366
Coke	240 36 41.28	61 05 52.13	4.8998385	49.339
North Mountain	264 48 45.29	85 27 48.32	4.9712991	58.163

MOUNT PEALE, SAN JUAN COUNTY, UTAH. (Not occupied.)

Station and signal is a rock cairn on the highest point of Mount Peale, which is the highest peak of the La Sal Range. The peak is on the south side of the La Sal Range.

[Latitude 38° 26′ 19.048″. Longitude 109° 13′ 43.237″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Mount Waas	180 36 48.49	0 36 51.56	4.0482451	6.944
Pace	228 58 51.16	49 04 31.86	4.2447974	10.918
Montpelier	253 00 03.49	73 21 47.74	4.7244604	32.947
Coke	299 34 28.33	119 55 09.93	4.7484857	34.821
Gypsum	312 54 31.39	133 09 13.86	4.6752488	29.417

PACE, GRAND COUNTY, UTAH.

Station is on the east end of a timber-covered ridge just above and west of Sinbad Valley. There is a rough wagon road from Paradox to Castleton, Utah, passing the Buckeye reservoir, Geyser reservoir, Roberson's summer ranch, and the Taylor ranch. Station is 2 or 3 miles northeast of Taylor's ranch. Mr. Pace has a ranch on Rock Creek about 1 mile below Taylor's, which is south of station. There is another road (almost abandoned) passing to north of station, from the source of Rock Creek to Sinbad Valley and thence to Gateway, on Dolores River. Animals can be ridden to point from any direction.

Signal and station mark: A pine tree about 50 feet high with lower limbs cut off.

Reference mark: A triangulation tablet set in solid rock 10.7 feet from tree.

Azimuth tree to tablet: 88° 45′.

[Latitude 38° 32′ 32.694″. Longitude 109° 04′ 35.821″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Blue Mountain	23 31 44.60	203 17 26.62	4.9293889	52.813
Mount Peale	49 04 31.86	228 58 51.16	4.2447974	10.918
Mount Waas	88 32 05.16	268 26 27.16	4.1186746	8.166
Fir	216 43 18.57	36 53 34.28	4.5992107	24.692
Montpelier	264 02 38.31	84 18 42.82	4.5758634	23.400
Tree	283 14 53.55	103 36 20.07	4.7118665	32.005
Nucla	302 42 00.92	123 01 48.28	4.7420021	34.305
Skinout	304 16 11.49	124 21 07.42	4.1443393	8.663
Lone Cone	315 00 39.00	135 31 08.88	5.0096106	63.527
Coke	317 56 18.70	138 11 21.95	4.7231679	32.849
North	319 39 22.56	140 04 25.37	4.9620982	56.944
Gypsum	334 01 01.94	154 10 05.81	4.6877436	30.276

MOUNT WAAS, GRAND COUNTY, UTAH.

Described in United States Coast and Geodetic Survey Special Publication 19.

On the highest point of Mount Waas, which is the third prominent peak from the north end of the La Sal Mountains.

Station mark: A cross in a copper bolt which is set in a drill hole in the rock between the bases of three small brick piers used for mounting the instrument. The station is surrounded by a ring wall of rocks 4 feet high with an inner diameter of 10 feet.

Reference marks: Four reference marks, each probably consisting of a drill hole in the rock, are just outside the wall at the following distances and azimuths from the station: 2.24 meters, 3° 58′; 2.29 meters, 104° 19′; 2.18 meters, 186° 37′; and 2.21 meters 275° 45′. Mount Waas astronomic station, marked by a concrete pier, is 28.213 meters from the station in azimuth about 329°.

[Latitude 38° 32′ 21.44″. Longitude 109° 13′ 38.30″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Mount Peale	0 36 51.56	180 36 48.49	4.0482451	6.944
Tavaputs	189 44 44.32	9 53 07.69	5.0520834	70.054
Piñon	215 20 24.09	35 38 26.38	4.8560394	44.606
Fir	228 48 23.50	49 04 18.25	4.6898898	30.426
Mams or North Mam	231 00 50.17	51 52 12.76	5.1787597	93.780
Grand	235 50 39.97	56 27 17.54	5.0082586	63.330
Leon	243 02 30.82	63 54 32.75	5.1281457	83.463
Mesa	245 56 21.53	66 35 42.37	4.9982566	61.888
Montpelier	265 06 41.15	85 28 23.76	4.7056158	31.548
Pace	268 26 27.16	88 32 05.16	4.1186746	8.166
Tree	280 10 44.16	100 37 48.25	4.8082458	39.957
Skinout	286 51 14.56	107 01 48.22	4.4112776	16.019
Uncompahgre	288 01 25.77	109 07 06.12	5.2119946	101.238
Nucla	296 14 01.45	116 39 25.78	4.8227769	41.317
Coke	308 36 57.41	128 57 37.33	4.7939472	38.663
Lone Cone	310 01 23.53	130 37 28.93	5.0480353	69.404
North Mountain	313 42 53.52	134 13 31.95	5.0017961	62.395

UTAH.

TRIANGULATION STATIONS.

Marsh Peak and Vernal quadrangles.

UINTA COUNTY.

During the season of 1913 Oscar Jones extended triangulation southward from Little Mountain and Marsh Peak, described in Bulletin 181, in order to control the Vernal quadrangle. Eleven stations were occupied and four points were located by intersection, on North American datum.

B. M., UINTA COUNTY, UTAH. (Not occupied.)

Station on a high bluff south side of Green River, 6 miles northeast of Ouray.
Station mark: A bench-mark tablet in bowlder marked "B. M. 5071 V. A."

[Latitude 40° 10′ 36.44″. Longitude 109° 36′ 23.11″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Ouray	68 45 37.23	248 39 29.30	4.1611829	9.00
Halfway	152 47 58.25	332 44 48.84	4.3024880	12.47
White	359 05 54.93	179 05 58.63	3.9360875	5.36

CONE, UINTA COUNTY, UTAH.

On a high, very sharp cone-shaped butte 7 miles west of Ouray.
Signal: Cairn over station.
Station mark: A flat sandstone bowlder in which is drilled a 1-inch hole and marked "U. S. 53° 26′ G. S."

[Latitude 40° 06′ 05.59″. Longitude 109° 50′ 13.15″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Randlett	194 21 01.61	14 22 47.29	4.1937695	9.70
Halfway	201 41 02.58	21 45 47.60	4.4502309	17.52
Vernal	218 30 09.70	38 41 22.87	4.5964331	24.53
Ouray	243 16 13.64	63 19 00.83	3.8374573	4.28
White	270 43 33.27	90 52 31.61	4.2966286	12.30
Nipple	282 10 17.18	102 20 36.02	4.3674429	14.48

DEEP CREEK, UINTA COUNTY, UTAH. (Not occupied.)

On southwest end of high ridge 1 mile northeast of Taft post office, one-fourth mile west of Deep Creek.
Station mark: A large cairn.

[Latitude 40° 24′ 42.85″. Longitude 109° 47′ 17.90″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Vernal	279 54 38	100 04 00	4.3171666	12.90
Halfway	322 44 58	142 47 51	4.0161607	6.45

HALFWAY, UINTA COUNTY, UTAH.

On a table-top butte, 14 miles southwest of Vernal, 2 miles northwest of crossing of Vernal and Fort Duchesne wagon road with Halfway Hollow.

Station mark: Tablet in bowlder.

Signal and reference mark: Cairn, distance 3.5 feet, true azimuth 67° 11′.

[Latitude 40° 20′ 14.91″. Longitude 109° 42′ 51.74″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Ouray	10 33 44.79	190 31 47.27	4.3711066	14.60
Cone	21 45 47.60	201 41 02.58	4.4502309	17.52
Randlett	30 41 05.85	210 38 06.34	4.1092074	7.99
Roosevelt	69 44 48.52	249 36 27.71	4.2899423	12.11
Deep Creek	142 47 50.82	322 44 58.40	4.0161607	6.45
Taft	146 23 29.13	326 20 16.21	4.1030978	7.88
Vernal	251 43 52.27	71 50 21.23	4.1737941	9.27
B. M.	332 43 48.84	152 47 58.25	4.3024880	12.47
Nipple	338 24 45.72	158 30 21.18	4.5248155	20.80
White	340 33 37.23	160 37 51.86	4.4481970	17.44

LITTLE MOUNTAIN, UINTA COUNTY, UTAH.

Station is on mountain shown on Hayden map as Obelisk Plateau, locally known as Little Mountain, and near highest point.

Station mark: Copper bolt cemented in sandstone rock and marked "S. G. △ U. S."

Reference point: A post on highest point of mountain, marking the point of U. S. M. R. ("O. M. R."), and supported by a pile of rocks, 9.55 feet distant, true azimuth of which is 30° 26′.

[Latitude 40° 32′ 18.40″. Longitude 109° 41′ 55.65″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Taft	35 21 23.30	215 17 33.57	4.1587528	8.96
Marsh	150 21 36.00	330 16 33.05	4.3440832	13.72
Trout Creek Peak	178 22 03.68	358 21 41.82	4.4410184	.....
Lena	220 57 50.04	41 08 57.10	4.5636299	.....
Red	243 05 18.88	63 10 57.62	4.1378363	8.54
Vernal Tabernacle	304 28 44	124 35 03	4.2216261	10.35
Vernal	323 56 19.23	144 02 12.60	4.3389033	13.56

MARSH PEAK, UINTA COUNTY, UTAH.

On peak of same name on east end of that portion of the Uinta Range which rises above timber line.

Station mark: Aluminum tablet cemented in large flat rock with rocks piled around and over it.

Reference point: Large rock monument, 15.75 feet distant, true azimuth of which is 276° 53′.

[Latitude 40° 42′ 40.42″. Longitude 109° 49′ 40.94″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Gilbert Peak	106 18 00.22	285 57 57.66	4.6528536	.....
Phil Pico	164 57 33.64	344 53 55.73	4.4774312	.....
Leidy Peak	175 47 49.36	355 47 36.34	3.8050251	.....
Twin Buttes	191 16 48.14	11 21 39.70	4.7243835	.....
Trout Creek Peak	230 15 37.15	50 20 18.97	4.1194058	.....
Richards Butte	232 26 46.63	52 47 20.28	4.7448761	.....
Lena	256 18 37.30	76 34 49.24	4.5554878	.....
Red	299 10 11.76	119 20 54.22	4.4241722	10.80
Little Mountain	330 16 33.05	150 21 36.00	4.3440832	13.72
Taft	355 08 52.21	175 10 04.69	4.4922556	19.30

NIPPLE, UINTA COUNTY, UTAH. (Not occupied.)

A very sharp cone (can not be occupied) 6 miles east of Ouray, 1 mile south of White River. Well known as "Mollie's Nipple."

[Latitude 40° 03′ 25.17″. Longitude 109° 34′ 11.99″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Cone	102 20 36.02	282 10 17.18	4.3674429	14.48
Ouray	115 52 16.77	295 44 44.85	4.2668832	11.47
White	147 33 10.85	327 31 50.12	3.7431804	3.44
Halfway	158 30 21.18	338 24 45.72	4.5248155	20.80
Vernal	183 03 02.30	3 03 54.53	4.5545964	22.28

OURAY, UINTA COUNTY, UTAH.

On east edge of a flat mesa 4 miles northwest of Ouray, 1 mile west of Duchesne River.

Station mark: Tablet in bowlder over which is a cairn for signal.

[Latitude 40° 07′ 45.81″. Longitude 109° 45′ 53.70″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Cone	63 19 00.83	243 16 13.64	3.8374573	4.28
Roosevelt	139 26 20.81	319 19 58.52	4.3327866	13.37
Randlett	169 22 04.93	349 21 03.22	4.0882917	7.62
Halfway	190 31 47.27	10 33 44.79	4.3711066	14.60
Vernal	213 35 41.30	33 44 06.98	4.5232847	20.73
B. M.	248 39 29.30	68 45 37.23	4.1611829	9.00
White	283 48 34.30	103 54 45.63	4.1479058	8.74
Nipple	295 44 44.86	115 52 16.77	4.2663332	11.47

RANDLETT, UINTA COUNTY, UTAH.

On a very sharp rocky butte one-half mile east of Randlett.

Station mark: Tablet in large bowlder.

Signal and reference mark: Small cairn on top of large bowlder which is highest point of butte, distance from station 15.80 feet, true azimuth 13° 48′.

[Latitude 40° 14′ 16.28″. Longitude 109° 47′ 29.34″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Cone	14 22 47.29	194 21 01.61	4.1937695	9.70
Roosevelt	110 07 35.28	290 02 14.38	4.0967381	7.77
Taft	178 44 29.56	358 44 16.52	4.3349208	13.44
Halfway	210 38 06.34	30 41 05.85	4.1092074	7.99
Vernal	232 44 59.20	52 44 27.34	4.4154198	16.17
White	314 02 41.84	134 09 55.28	4.3452465	13.76
Ouray	349 21 03.22	169 22 04.93	4.0882917	7.62

RED, UINTA COUNTY, UTAH.

On summit of Red Mountain, 10 miles north of Vernal. Good view in all directions; wagon road from Vernal to within one-fourth mile of station.

Signal and reference mark: A quadripod with targets, distance 2.5 feet, true azimuth 197° 41′.

Station mark: Tablet in solid rock.

[Latitude 40° 35′ 39.62″. Longitude 109° 33′ 14.78″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Little Mountain	63 10 57.62	243 05 18.88	4.1378363	8.54
Marsh	119 20 54.22	299 10 11.76	4.4241722	10.80
Tabernacle	354 40 28	174 41 09	4.1963837	9.77
Vernal	358 39 29.50	178 39 44.88	4.3777653	14.83

ROOSEVELT, UINTA COUNTY, UTAH.

On a sharp butte 3 miles east of Roosevelt, 1 mile south of road from Roosevelt to Fort Duchesne.

Station mark: Tablet in solid rock.

Signal: A cairn over station mark.

[Latitude 40° 16′ 35.38″. Longitude 109° 55′ 45.93″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Taft	212 56 05.29	33 01 13.79	4.3150383	12.84
Halfway	249 36 27.71	69 44 48.52	4.2899423	12.11
Randlett	290 02 14.38	110 07 35.28	4.0967381	7.77
Ouray	319 19 58.52	139 26 20.81	4.3327866	13.37

TAFT, UINTA COUNTY, UTAH.

On a long bare ridge running northeast one-half mile west of Deep Creek, 2 miles north of Taft post office.

Station mark: Tablet in bowlder.

Signal: Quadripod with targets, distance from station 3.8 feet, true azimuth 83° 35′.

[Latitude 40° 25′ 57.16″. Longitude 109° 47′ 49.49″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Roosevelt	33 01 13.79	212 56 05.29	4.3150383	12.84
Marsh	175 10 04.69	355 08 52.21	4.4922556	19.30
Little Mountain	215 17 33.57	35 21 23.30	4.1587528	8.96
Vernal	285 27 48.81	105 37 31.15	4.3421958	13.66
Halfway	326 20 16.21	146 23 29.13	4.1030978	7.88
Randlett	358 44 16.52	178 44 29.56	4.3349208	13.44

VERNAL, UINTA COUNTY, UTAH.

On a range of bare hills 5 miles south of Vernal. Vernal and Fort Duchesne wagon road crosses ridge 1 mile west of station.

Station mark: Tablet in bowlder.

Signal and reference mark: Large rock cairn, distance from station 5 feet, true azimuth 304° 02′.

[Latitude 40° 22′ 46.12″. Longitude 109° 32′ 51.09″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Nipple	3 03 54.53	183 03 02.30	4.5545964	22.28
White	8 55 08.98	188 52 55.72	4.4985352	19.58
Ouray	33 44 06.98	213 35 41.30	4.5232847	20.73
Cone	38 41 22.87	218 30 09.70	4.5964331	24.53
Randlett	52 54 27.34	232 44 59.20	4.4154198	16.17
Halfway	71 50 21.23	251 43 52.27	4.1737941	9.27
Deep Creek	100 04 00	279 54 38	4.3171666	12.90
Taft	105 37 31.15	285 27 48.81	4.3421958	13.66
Little Mountain	144 02 12.60	323 56 19.23	4.3389033	13.56
Red	178 39 44.88	358 39 29.50	4.3777653	14.83

VERNAL TABERNACLE, UINTA COUNTY, UTAH. (Not occupied.)

Station mark: Center of spire of Mormon Tabernacle at Vernal.

[Latitude 40° 27′ 12.27″. Longitude 109° 32′ 12.89″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Vernal	6 15 52	186 15 26	3.9168974	5.13
Little Mountain	124 35 03	304 28 44	4.2216261	10.35
Red	174 41 09	334 40 29	4.1963837	9.77

WHITE, UINTA COUNTY, UTAH.

On the east end of a high ridge 5 miles east of Ouray, 1 mile north of White River; wagon road from Watson to Ouray passes one-half mile south of station.

Station mark: Tablet in bowlder over which is a cairn for signal.

[Latitude 40° 05′ 56.62″. Longitude 109° 36′ 17.38″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Cone	90 52 31.61	270 43 33.27	4.2966286	12.30
Ouray	103 54 45.63	283 48 34.30	4.1479058	8.74
Randlett	134 09 55.28	314 02 41.84	4.3452465	13.76
Halfway	160 37 51.86	340 33 37.23	4.4481970	17.44
B. M.	179 05 58.63	359 05 54.93	3.9360875	5.36
Vernal	188 52 55.72	8 55 08.98	4.4985352	19.58
Nipple	327 31 50.12	147 33 10.85	3.7431804	3.44

Camels Back, Dunstein, Fort Douglas, McDowell Mountain, Mammoth, Mercur, Provo, and Saltair 30′ quadrangles.

JUAB, MILLARD, SALT LAKE, TOOELE, AND UTAH COUNTIES.

The following positions on North American datum were determined by primary triangulation by Charles F. Urquhart in July, August, and September, 1915. The values are based upon United States Coast and Geodetic Survey stations Mount Nebo and Deseret.

Three stations of the United States Coast and Geodetic Survey were occupied and six were tied to by intersections. Ten new primary points were established and 35 secondary points were located by intersections. Bingham Geological Survey station, located by the three-point method by R. U. Goode in 1899, and Mammoth Peak (Eureka), located by same method by S. S. Gannett in 1896, were relocated.

ALPINE, UTAH COUNTY, UTAH. (Not occupied.)

Station is the highest point of mountain peak about 5 or 6 miles north of Alpine. It is about 4 miles southeast of Lone Peak Needle and not so high, but very prominent.

[Latitude 40° 29′ 24.931″. Longitude 111° 41′ 44.424″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Lake	42 31 34.03	222 21 53.40	4.4958027	19.460
Cedar Point	70 56 23.93	250 45 16.60	4.4091974	15.942
Herriman	80 38 33.31	260 18 59.57	4.6356309	26.852

ANT HILL, UTAH COUNTY, UTAH.

On a sagebrush hill about 10 miles southeast of Fairfield and about 15 miles north-northwest from Goshen. The Fairfield-Goshen road passes within a mile of point where it crosses the divide between Cedar Valley and Goshen Valley. Can be easily reached on horseback from any direction.

Signal: A rock cairn 6 feet at base and 7 feet high.

Station mark: A United States Geological Survey bronze triangulation tablet set under center of signal in solid rock.

[Latitude 40° 07′ 55.364″. Longitude 111° 59′ 46.707″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Boulter	50 12 21.25	230 04 37.76	4.3469113	13.812
Lava	126 21 38.61	306 15 36.56	4.2168994	10.239
Lone Cedar	136 15 03.36	316 06 42.75	4.4228777	16.452
Fairfield	148 42 14.03	328 38 12.19	4.2315855	10.591
Herriman	152 19 05.13	332 11 15.41	4.5666387	22.908
Tank	162 14 35.10	342 11 36.37	4.3309479	13.314
Cedar Point	182 18 50.49	2 19 25.23	4.4967032	19.501
Lake	194 46 57.55	14 48 57.73	4.2364524	10.710
Provo No. 2	240 38 55.53	60 54 45.31	4.6004240	24.761
Y	247 52 47.81	68 07 20.64	4.5379087	21.442
Springville	251 24 46.18	71 41 48.24	4.5965579	24.542
Spanish Fork	276 47 10.91	97 05 19.09	4.6052714	25.039
Santaquin	297 15 05.76	117 29 30.25	4.5545058	22.277
Nebo	331 01 08.29	151 10 01.35	4.6099874	25.313

BENNION, TOOELE COUNTY, UTAH.

On the summit of a high rocky peak at the source of Pine Canyon. There are two peaks to the north of it with about the same elevation. There is no local name for this mountain. It is about 10 miles in an air line south-southwest of Vernon and about 4 miles southwest of Israel Bennion's ranch. Can be reached on horseback by going up Pine Canyon. There is a spring in Pine Canyon about a mile below signal, but there is very little feed on the mountain. A party may camp at Mr. Bennion's ranch.

Signal and station mark: A spruce tree supported in a cleft in the solid rock by a small rock cairn.

Reference mark: A United States Geological Survey triangulation tablet set in top of high rock on north end of peak.

[Latitude 39° 59′ 05.263″. Longitude 112° 32′ 23.275″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Skull	98 03 15.00	277 56 12.32	4.1974047	9.789
Granite	104 34 53.76	284 06 41.11	4.8085240	39.983
Castle	113 49 45.82	293 33 40.81	4.5890038	24.119
Round Top	136 12 59.87	316 05 41.51	4.3674218	14.480
Scrub	149 28 05.15	329 11 29.72	4.8534148	44.337
Deseret	172 08 03.84	352 04 44.12	4.7263053	33.087
Stookey	179 28 53.87	359 28 46.63	4.4672738	18.223
South	187 45 46.03	7 49 05.54	4.7314782	33.483
Faust	209 07 25.38	29 13 14.85	4.4211952	16.389
Herriman	210 35 52.00	30 49 06.02	4.7556079	35.396
Vernon	216 34 46.80	36 38 53.50	4.1830661	9.471
Center	220 30 21.32	40 36 29.57	4.3192931	12.961
Lava	231 34 08.69	51 49 07.53	4.6244640	26.171
Topliff	235 34 55.84	55 47 34.06	4.5288057	20.997
Lake	236 45 08.32	57 08 09.47	4.7819410	37.609
Boulter	265 47 16.46	86 00 31.19	4.4684884	18.274
Sabie	276 34 50.71	96 42 30.41	4.2328388	10.622
Eureka	278 47 13.85	99 04 03.61	4.5772146	23.473
Nebo	286 00 56.61	106 30 43.85	4.8385542	42.845
Sunrise	294 24 14.98	114 42 18.99	4.6447713	27.423
Salt Creek	297 13 01.04	117 43 39.02	4.8860569	47.798
Dutch	302 30 43.67	122 33 02.13	3.7829655	3.770
Maple	305 04 19.12	125 12 44.74	4.3594315	14.216
Sevier	326 03 11.75	146 15 29.10	4.6919962	30.574
Scipio	336 23 18.09	156 36 04.12	4.8553038	44.530

BINGHAM, SALT LAKE COUNTY, UTAH. (Not occupied.)

Same as the three-point station located by R. U. Goode and described in Twenty-first Annual Report of the United States Geological Survey, part 1, page 348, as follows:

"On the point on summit of Oquirrh Mountains, south of and about one-fourth mile from wagon road which crosses main divide from Bingham Canyon by way of United States mine to Middle Fork. The station is on the eastern one of two summits.

"Station mark: Rock cairn."

[Latitude 40° 30′ 01.439″. Longitude 112° 10′ 31.037″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Herriman	13 11 03.21	193 10 09.85	3.9292942	5.280
Cedar Point	300 03 38.36	120 11 11.33	4.2791274	11.816
Lake	320 58 51.44	141 07 49.60	4.4936302	19.363

BOULTER, TOOELE COUNTY, UTAH.

Station is on the most western of two high bald peaks about 6 miles east of Lofgreen, a station on the San Pedro, Los Angeles & Salt Lake Railroad, and about 6 miles northwest of Eureka. The mountains are locally known as the Boulter Mountains. Can be reached on horseback from any direction, but the mountain is rather rocky. A party may camp at Lofgreen or Eureka.

Signal: A rock cairn 6 feet high and 6 feet in diameter at the base, supporting a spruce tree in the center.

Station mark: A United States Geological Survey triangulation tablet set in solid rock under center of tree.

[Latitude 40° 00′ 13.467″. Longitude 112° 11′ 46.750″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Scipio	0 44 55.02	180 44 31.37	4.8314061	42.146
Sevier	2 41 24.25	182 40 30.06	4.6336404	26.729
Maple	34 56 17.03	214 51 29.00	4.2700132	11.571
Sabie	71 46 26.98	251 40 52.19	4.1145377	8.089
Bennion	86 00 31.19	265 47 16.46	4.4684884	18.274
Lookout	99 38 26.33	279 23 44.56	4.5180057	20.481
Vernon	116 41 20.07	296 32 11.18	4.3544334	14.053
Stookey	132 46 13.34	312 32 49.19	4.6039360	24.962
Deseret	144 19 22.09	324 02 43.67	4.7955244	38.804
South	156 55 59.75	336 46 00.60	4.7464506	34.658
Topliff	175 18 50.08	355 18 12.30	4.2304960	10.564
Herriman	179 48 45.21	359 48 41.01	4.6709339	29.126
Lava	188 53 32.48	8 55 14.82	4.3855460	15.097
Cedar Point	201 47 39.20	21 55 58.74	4.6914210	30.533
Lake	214 40 43.39	34 50 27.62	4.5754788	23.379
Ant Hill	230 04 37.76	50 12 21.25	4.3469113	13.812
Y	240 50 28.79	61 12 44.52	4.7489157	34.855
Springville	243 40 43.36	64 05 28.10	4.7835758	37.751
Spanish Fork	260 27 30.52	80 53 20.55	4.7624765	35.961
Santaquin	272 25 56.56	92 48 02.67	4.6901980	30.447
Nebo	300 02 57.32	120 19 31.61	4.6292985	26.464
Salt Creek	313 55 11.67	134 12 37.92	4.7327911	33.585
Eureka	314 57 49.00	135 01 24.66	4.0517938	7.001
Sunrise	332 11 04.66	152 15 55.52	4.3637293	14.358

CASTLE, TOOELE COUNTY, UTAH. (Not occupied.)

Highest point of low but very prominent mountain in Skull Valley. All the country near by is desert.

[Latitude 40° 07′ 31.022″. Longitude 112° 57′ 22.851″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Deseret	217 00 53.36	37 13 43.11	4.6682447	28.946
Stookey	248 34 00.60	68 50 01.00	4.5773784	23.482
Bennion	293 33 40.81	113 49 45.82	4.5890038	24.119

CEDAR POINT, UTAH COUNTY, UTAH.

On the point of a low, bare ridge about 6 miles west-northwest of Lehi, and about 9 miles northeast of Cedar Valley. The road from Lehi to Cedar Valley passes within 2 miles of the point where it joins the road from Riverton to Lehi. Can be easily reached on horseback from any direction.

Signal: A rock cairn 5 feet at base and 5 feet high.

Station mark: A United States Geological Survey bronze triangulation tablet set in solid rock under center of monument.

[Latitude 40° 24′ 52.030″. Longitude 111° 58′ 52.962″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Ant Hill	2 19 25.23	182 18 50.49	4.4967032	19.501
Boulter	21 55 58.74	201 47 39.20	4.6914210	30.533
Fairfield	31 05 10.27	211 00 32.94	4.2924258	12.184
Lava	33 57 49.89	213 51 12.01	4.4154210	16.172
Tank	35 28 22.52	215 24 48.47	4.1286278	8.356
Herriman	94 01 09.04	273 52 43.11	4.2657439	11.458
Fowler	109 17 30.99	289 10 10.71	4.2289825	10.528
Bingham	120 11 11.33	300 03 38.36	4.2791274	11.816
Capitol	191 06 24.52	11 10 04.25	4.6135882	25.541
Murray	195 49 48.35	15 53 19.94	4.4477362	17.422
Lone Peak	236 45 32.95	56 54 20.76	4.3595518	14.220
Alpine	250 45 16.60	70 56 23.93	4.4091974	15.942
Timpanogas Flag	275 05 25.44	95 18 29.51	4.4570313	17.798
Lehi Temple	283 07 34.51	103 12 44.66	4.0640373	7.201
Lehi	287 29 12.53	107 34 58.48	4.1206544	8.204
Provo	288 39 42.92	108 54 59.17	4.5472876	21.910
Provo No. 2	289 28 10.66	109 43 28.40	4.5501625	22.055
Y	300 53 47.82	121 07 48.42	4.5535612	22.229
Spanish Fork	312 59 56.82	133 17 33.46	4.7240430	32.915
Lake	347 58 47.88	168 00 13.61	4.1767220	9.334

CENTER, TOOELE COUNTY, UTAH.

On a bald hill about 4 miles northeast of Vernon and about 5 miles south of Faust, a station on the San Pedro, Los Angeles & Salt Lake Railroad. Can be easily reached on horseback from any direction. A party may camp at Vernon or at a ranch near Faust.

Signal: A rock cairn 6 feet in diameter at the base and 7 feet high.

Station mark: A United States Geological Survey bronze triangulation tablet under center of cairn.

[Latitude 40° 07′ 39.089″. Longitude 112° 22′ 51.054″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Dutch	23 54 00.56	203 50 11.09	4.3200949	12.985
Bennion	40 36 29.57	220 30 21.32	4.3192931	12.961
Vernon	51 04 15.26	231 02 13.66	3.7594769	3.571
Lookout	63 42 31.97	243 34 56.88	4.2714403	11.609
Stookey	134 22 21.91	314 16 05.41	4.2853657	11.987
Deseret	150 38 35.53	330 29 05.45	4.6270070	26.324
South	170 37 07.55	350 34 17.27	4.5803847	23.645
Faust	174 26 30.21	354 26 11.15	3.8582885	4.484
East Poplar	189 56 21.19	9 58 01.49	4.3273009	13.202
Herriman	205 04 17.15	25 11 22.40	4.5634045	22.738
Lone Cedar	216 14 38.31	36 21 11.55	4.3860946	15.116
Lava	242 08 51.27	62 17 42.29	4.3426843	13.678
Lake	245 03 13.70	65 20 07.50	4.6119155	25.425
Topliff	257 21 37.19	77 28 07.62	4.1669933	9.127
Sabie	349 11 53.00	169 13 25.20	4.2587933	11.276

CLOVER, TOOELE COUNTY, UTAH. (No check; not occupied.)

Station is center of cupola on church at Clover, a post office in Rush Valley.

[Latitude 40° 20′ 22.130″. Longitude 112° 27′ 38.378″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Stookey	34 50 39.83	214 47 28.32	4.0881213	7.612
South	182 18 58.10	2 19 13.69	4.1466747	8.710

DESERET, TOOELE COUNTY, UTAH.

United States Coast and Geodetic Survey station, described as follows in United States Coast and Geodetic Survey Special Publication 19:

"On the summit of the highest peak of the Onaqui Mountains, about 8 miles a little west of south from Grantsville and about 12 miles east of Stockton. The station is marked by a copper bolt set in solid rock between the bases of three small piers used for mounting the instrument. The station is nearly surrounded by a ring wall of rocks 4 feet high, with an inner diameter of 11 feet. Three reference marks are just outside the wall at the following distances and azimuths from the station: 3.10 meters, 322° 53′; 2.18 meters, 88° 08′; and 2.62 meters, 198° 38′. Deseret latitude station, marked by a stone and brick pier, is 10.85 meters from station in azimuth 27° 42′." (Page 131.)

The circular wall described above had caved in on the east side, so a rock monument 10 feet at base and 9 feet high, was built around the pier used by the Coast Survey.

The best camping place on the east side of the mountain is at Mr. Wrathall's ranch, on Box Elder Creek. Go from this ranch over low divide to South Willow Creek; thence up South Willow Creek to foot of peak; thence on foot to summit.

The Coast Survey describes the station as being 10 miles east of Stockton, when it should be west.

[Latitude 40° 27′ 35.301″. Longitude 112° 37′ 32.551″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Skull	9 17 03.49	189 13 18.48	4.7094298	31.826
Round Top	13 45 56.04	193 41 55.55	4.5681320	22.987
Castle	37 13 43.11	217 00 53.36	4.6682447	28.946
Tree	53 29 16.46	233 25 20.36	4.0286209	6.637
Granite	56 20 07.20	235 55 06.23	4.8197025	41.025
Scrub	106 41 18.99	286 27 59.56	4.4806348	18.793
Onaqui	183 23 19.92	3 23 45.93	4.2019090	9.891
Smelter	253 27 41.48	73 43 20.32	4.5499679	22.045
Tooele	253 44 57.28	73 58 11.63	4.4769088	18.632
South	267 24 28.66	87 31 09.86	4.1637472	9.059
Herriman	275 47 18.30	96 03 56.83	4.5619576	22.662
Lone Cedar	296 03 04.12	116 19 09.82	4.5930705	24.346
East Poplar	303 03 01.94	123 14 13.77	4.4654817	18.148
Lava	303 21 07.76	123 39 31.22	4.6835226	29.983
Nebo	314 14 12.20	134 47 27.68	5.0118874	63.861
Boulter	324 02 43.67	144 19 22.09	4.7955244	38.804
Sabie	336 01 18.44	156 12 20.10	4.7770456	37.187
Scipio	343 02 15.28	163 18 23.66	5.0925837	76.901
Stookey	343 15 20.46	163 18 33.45	4.3882959	15.193
Bennion	352 04 44.12	172 08 03.84	4.7263053	33.087

DUTCH, TOOELE COUNTY, UTAH. (Not occupied.)

Highest point of prominent mountain locally known as "Dutch Peak," about 10 miles a little west of south from Vernon.

[Latitude 39° 57′ 19.482″. Longitude 112° 28′ 47.740″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Bennion	122 33 02.13	302 30 43.67	3.7829655	3.770
Center	203 50 11.09	23 54 00.56	4.3200949	12.985
Sabie	263 46 37.92	83 51 59.04	4.0768704	7.417

EAST POPLAR, TOOELE COUNTY, UTAH. (Not occupied.)

The eastern one of two very prominent trees on Bates Creek, about a mile below the Bates ranch. The road from Fairfield to Stockton passes on the east side of point and by the Bates ranch. This is the only ranch between Fairfield and Stockton.

[Latitude 40° 18′ 57.589″. Longitude 112° 20′ 15.734″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Center	9 58 01.49	189 56 21.19	4.3273009	13.202
Stookey	66 57 08.21	246 49 10.55	4.2781866	11.791
Deseret	123 14 13.77	303 03 01.94	4.4654817	18.148
South	149 18 59.65	329 14 28.39	4.2861388	12.009
Lava	304 00 04.61	124 07 16.27	4.2798307	11.835

EUREKA (MAMMOTH PEAK), TOOELE COUNTY, UTAH. (Not occupied.)

The highest point of a prominent peak south of the town of Eureka, one-half mile east of Mammoth mine—the same point located by the United States Geological Survey for control of the Tintic quadrangle, in 1896, called Mammoth Peak.

Station mark: A cairn on highest part of summit.

[Latitude 39° 55′ 55.191″. Longitude 112° 06′ 11.021″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Bennion	99 04 03.61	278 47 13.85	4.5772146	23.473
Sabie	100 53 20.79	280 44 10.67	4.3160795	12.866
Boulter	135 01 24.66	314 57 49.00	4.0517938	7.001

FAIRFIELD, UTAH COUNTY, UTAH. (Not occupied.)

Smokestack on an old mill on west side of village of Fairfield, about 10 miles southeast of Lehi.

[Latitude 40° 15′ 47.401″. Longitude 112° 06′ 01.402″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Lava	42 34 20.08	222 32 19.60	3.8141564	4.050
Cedar Point	211 00 32.94	31 05 10.27	4.2924258	12.184
Lake	260 55 16.29	81 01 18.85	4.1276734	8.337
Ant Hill	328 38 12.19	148 42 14.03	4.2315855	10.591

FAUST, TOOELE COUNTY, UTAH. (Not occupied.)

Center of water tank at Faust station on the San Pedro, Los Angeles & Salt Lake Railroad. There is no town at this station.

[Latitude 40° 11′ 31.941″. Longitude 112° 23′ 20.601″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Bennion	29 13 14.85	209 07 25.38	4.4211952	16.389
Stookey	115 43 34.98	295 37 37.31	4.1623178	9.030
South	169 43 12.31	349 40 41.04	4.4893477	19.173
Herriman	211 57 54.31	32 05 18.96	4.4858073	19.018
Lava	261 14 47.38	81 23 57.83	4.3096160	12.675
Center	354 26 11.15	174 26 30.21	3.8582885	4.484

FOWLER, SALT LAKE COUNTY, UTAH. (Not occupied.)

Rock cairn built by Mr. Fowler on the east side of the range and about 3 miles north-northeast of Herriman triangulation station.

[Latitude 40° 27′ 52.951″. Longitude 112° 10′ 11.723″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Herriman	29 02 33.75	209 01 27.89	3.6928631	3.063
Cedar Point	289 10 10.71	109 17 30.99	4.2289825	10.528
Lake	316 34 43.57	136 43 29.03	4.4452791	17.323

GRANITE, TOOELE COUNTY, UTAH. (Not occupied.)

On highest point of Granite Mountain, a well-known peak. It was located by the United States Coast and Geodetic Survey.

[Latitude 40° 07′ 42.220″. Longitude 113° 16′ 13.478″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Deseret	235 55 06.23	56 20 07.20	4.8197025	41.025
Stookey	257 34 37.03	78 02 47.07	4.8019684	39.384
Bennion	284 06 41.11	104 34 53.76	4.8085240	39.983

HERRIMAN, UTAH AND TOOELE COUNTIES, UTAH.

Herriman is a point located by the United States Coast and Geodetic Survey on which there was no signal. It is one of the highest points of the Oquirrh Range, but probably lower than the Flat Top Mountain, northwest of Cedar Valley. It is on the line between Utah and Tooele counties and about 2 miles south of Salt Lake County. Both the north and south forks of creek known as West Canyon head at the peak and flow east. The source of Bates Creek is also at this peak; the creek flows west.

The best way to reach the point on horseback is up the south fork of West Canyon. It can also be reached from the west up Bates Creek.

Signal: A rock cairn 6[illegible] eet at base and 6 feet high.

Station mark: A United States Geological Survey tablet set in solid rock under center of monument.

[Latitude 40° 25′ 33.199″. Longitude 112° 11′ 53.255″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Scipio	0 21 53.79	180 21 34.21	5.0595560	71.270
Sable	13 28 41.49	193 23 09.43	4.7192358	32.553
Center	25 11 22.40	205 04 17.15	4.5634045	22.738
Bennion	30 49 06.02	210 35 52.00	4.7556079	35.396
Faust	32 05 18.96	211 57 54.31	4.4858073	19.018
Stookey	56 15 38.47	236 02 15.02	4.5475088	21.921
Deseret	96 03 56.83	275 47 18.30	4.5619576	22.662
South	101 34 14.95	281 24 17.42	4.3453741	13.763
Onoqui	119 14 57.76	298 58 43.77	4.6063886	25.104
Bingham	193 10 09.85	13 11 03.21	3.9292942	5.280
Fowler	209 01 27.89	29 02 33.75	3.6928631	3.063
Capitol	213 50 13.03	34 02 20.60	4.6728449	29.255
Murray	225 15 31.09	45 27 29.90	4.5631845	22.727
Lone Peak	253 10 17.15	73 27 31.54	4.5931168	24.348
Alpine	260 18 59.57	80 38 33.31	4.6356309	26.852
Cedar Point	273 52 43.11	94 01 09.04	4.2657439	11.458
Lehi Temple	277 23 28.61	97 37 04.61	4.4762258	18.603
Lehi	279 29 34.75	99 43 46.49	4.4973366	19.529
Provo	283 30 17.21	103 53 58.97	4.7267679	33.122
Spanish Fork	303 04 50.77	123 30 51.78	4.8344067	42.438
Lake	306 27 40.63	126 37 31.62	4.4282809	16.658
Tank	319 00 02.39	139 04 53.73	4.2092003	10.059
Nebo	331 30 20.33	151 47 03.20	4.8898558	48.218
Ant Hill	332 11 15.41	152 19 05.13	4.5666387	22.908
Boulter	359 48 41.01	179 48 45.21	4.6709339	29.126

LAVA, TOOELE AND UTAH COUNTIES, UTAH.

On a peak in a low range of mountains dividing the counties of Tooele and Utah, and about 1 mile south of Fivemile Pass on road between Fairfield and Rush Valley. It is about 4 miles in an air line southwest of Fairfield. It can be reached on horseback from any direction.

Signal: A rock cairn 6 feet in diameter at base and 6 feet high.

Station mark: A United States Geological Survey triangulation tablet set in a rock which is buried under center of signal.

[Latitude 40° 13′ 11.721″. Longitude 112° 09′ 07.911″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Boulter	8 55 14.82	188 53 32.48	4.3855460	15.097
Sabie	29 53 30.01	209 46 12.16	4.5102086	20.117
Topliff	36 06 41.07	216 04 20.70	3.9412791	5.428
Bennion	51 49 07.53	231 34 08.69	4.6244640	26.171
Center	62 17 42.29	242 08 51.27	4.3426843	13.678
Lookout	63 00 42.62	242 44 16.48	4.6095115	25.285
Faust	81 23 57.83	261 14 47.38	4.3096160	12.675
Stookey	95 39 19.87	275 24 11.32	4.5238373	20.758
Deseret	123 39 31.22	303 21 07.76	4.6835226	29.983
East Poplar	124 07 16.27	304 00 04.61	4.2798307	11.835
South	136 52 20.36	316 40 37.04	4.5733417	23.264
Lone Cedar	151 35 38.19	331 33 19.82	4.0264669	6.604
Tank	212 14 29.00	32 17 32.85	4.1000052	7.823
Cedar Point	213 51 12.01	33 57 49.89	4.4154210	16.172
Fairfield	222 32 19.60	42 34 20.08	3.8141564	4.050
Lake	248 34 29.81	68 42 32.71	4.2779763	11.785
Provo	257 45 41.76	78 07 33.64	4.6905637	30.473
Ant Hill	306 15 36.56	126 21 38.61	4.2168994	10.239
Nebo	323 53 02.51	144 07 56.91	4.7492308	34.880

LAKE, UTAH COUNTY, UTAH.

On the northernmost high point of the Lake Mountains, a range on the west side of Utah Lake. It is about 10 miles in an air line southwest of Lehi and about 9 miles east of Fairfield. The summit, about a mile south, is a little higher than point on which station is situated. It can be easily reached on horseback.

Signal: A leaning cedar tree with lower branch removed.

Station mark: A United States Geological Survey bronze triangulation tablet set in solid rock under center of top of tree.

[Latitude 40° 16′ 55.666″. Longitude 111° 56′ 40.536″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Scipio	12 52 55.29	192 42 51.02	5.0053861	62.912
Ant Hill	14 48 57.73	194 46 57.55	4.2364524	10.710
Boulter	34 50 27.62	214 40 43.39	4.5754788	23.379
Sabie	44 07 45.69	223 52 25.92	4.6870508	30.227
Bennion	57 08 09.47	236 45 08.32	4.7819410	37.609
Center	65 20 07.50	245 03 13.70	4.6119155	25.425
Lava	68 42 32.71	248 34 29.81	4.2779763	11.785
Fairfield	81 01 18.85	260 55 16.29	4.1276734	8.337
Stookey	86 02 54.60	265 39 42.42	4.7078210	31.708
Lone Cedar	96 13 05.28	276 02 43.50	4.3586987	14.192
Herriman	126 37 31.62	306 27 40.63	4.4282809	16.658
Fowler	136 43 29.03	316 34 43.57	4.4452791	17.323
Bingham	141 07 49.60	320 58 51.44	4.4936302	19.363
Cedar Point	168 00 13.61	347 58 47.88	4.1767220	9.334
Capitol	184 59 55.74	5 02 09.12	4.7422145	34.321
Murray	186 12 53.75	6 14 59.11	4.6223265	26.042
Lone Peak	210 28 27.46	30 35 48.72	4.4996190	19.632
Lehi Temple	214 05 51.44	34 09 35.46	4.1631745	9.047
Lehi	221 26 56.24	41 31 16.02	4.1554509	8.888
Alpine	222 21 53.40	42 31 34.03	4.4958027	19.460
Timpanogas Flag	244 27 37.82	64 39 15.12	4.4496181	17.497
Provo No. 2	264 38 05.71	84 51 56.56	4.4838908	18.934
Springville	277 04 03.19	97 19 06.51	4.5222986	20.685
Spanish Fork	301 03 55.30	121 20 05.05	4.6187330	25.828
Santaquin	320 19 27.98	140 31 53.82	4.6334999	26.721
Nebo	343 41 13.55	163 48 07.66	4.7364366	33.868

LEHI, UTAH COUNTY, UTAH. (Not occupied.)

Large chimney at sugar factory about 1 mile southeast of Lehi.

[Latitude 40° 22′ 43.070″. Longitude 111° 49′ 59.155″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Lake	41 31 16.02	221 26 56.24	4.1554509	8.888
Herriman	99 43 46.49	279 29 34.75	4.4973366	19.529
Cedar Point	107 34 58.48	287 29 12.53	4.1206544	8.204

LEHI TEMPLE, UTAH COUNTY, UTAH. (Not occupied.)

Station mark: Center of steeple on Mormon Temple in the town of Lehi.

[Latitude 40° 23′ 26.431″. Longitude 111° 50′ 54.447″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Lake	34 09 35.46	214 05 51.44	4.1631745	9.047
Herriman	97 36 04.61	277 23 28.61	4.4762258	18.603
Cedar Point	103 12 44.66	283 07 34.51	4.0640373	7.201

LONE CEDAR, TOOELE COUNTY, UTAH. (Not occupied.)

A pine tree near the summit of ridge between Cedar Valley and Mercur Canyon. Wagon road passes this point. It was not occupied and the tree resembled a cedar from other stations. Later it was discovered to be a pine tree.

Station mark: Center of tree.

[Latitude 40° 18′ 14.764″. Longitude 112° 12′ 42.011″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Center	36 21 11.55	216 14 38.31	4.3860946	15.116
Stookey	77 50 07.78	257 37 16.85	4.4598684	17.915
Deseret	116 19 09.82	296 03 04.12	4.5930705	24.346
South	131 09 18.27	310 59 53.07	4.4360830	16.960
Lake	276 02 43.50	96 13 05.28	4.3586987	14.192
Ant Hill	316 06 42.75	136 15 03.36	4.4228777	16.452
Lava	331 33 19.82	151 35 38.19	4.0264669	6.604

LONE PEAK NEEDLE, UTAH AND SALT LAKE COUNTIES, UTAH. (Not occupied.)

This point is about 11 miles in an air line from Lehi and was located by the United States Coast and Geodetic Survey. It is the highest point in the vicinity and very prominent.

[Latitude 40° 31′ 37.936″. Longitude 111° 45′ 19.779″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Nebo	0 38 10.86	180 37 46.90	4.9006091	49.426
Lake	30 35 48.72	210 28 27.46	4.4996190	19.632
Cedar Point	56 54 20.76	236 45 32.95	4.3595518	14.220
Herriman	73 27 31.54	253 10 17.15	4.5931168	24.348
Spanish Fork	338 12 36.10	158 21 27.93	4.7199045	32.603

LOOKOUT, TOOELE COUNTY, UTAH. (Not occupied.)

On the highest point of Lookout Peak, about 8 miles a little south of west from Vernon.

[Latitude 40° 03′ 10.189″. Longitude 112° 34′ 37.724″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Stookey	187 38 07.61	7 38 27.07	4.3417620	13.649
Lava	242 44 16.48	63 00 42.62	4.6095115	25.285
Center	243 34 56.88	63 42 31.97	4.2714403	11.609
Boulter	279 23 44.56	99 38 26.33	4.5180057	20.481

MAPLE, TOOELE COUNTY, UTAH. (Not occupied.)

Highest point of very prominent mountain locally known as Maple Peak. It is about 10 miles southwest of Eureka, near the Cherry Creek settlement.

[Latitude 39° 51′ 58.275″. Longitude 112° 19′ 15.446″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Bennion	125 12 44.74	305 04 19.12	4.3594315	14.216
Sabie	171 16 57.08	351 16 10.69	4.0539323	7.035
Boulter	214 51 29.00	34 56 17.03	4.2700132	11.571
Nebo	277 11 14.85	97 32 35.16	4.6804632	29.772

MURRAY, SALT LAKE COUNTY, UTAH. (Not occupied.)

Large chimney at smelter in town of Murray.

[Latitude 40° 39′ 26.395″. Longitude 111° 53′ 27.400″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Lake	6 14 59.11	186 12 53.75	4.6223265	26.042
Cedar Point	15 53 19.94	195 49 48.35	4.4477362	17.422
Herriman	45 27 29.90	225 15 31.09	4.5631845	22.727

NEBO, JUAB COUNTY, UTAH.

Station is a United States Coast and Geodetic Survey station, described as follows in Special Publication 19:

"On the southernmost summit of Mount Nebo. The station is marked by a copper bolt in a drill hole in the solid rock. Three small brick piers used in mounting the instrument are about the station, and these in turn are nearly surrounded by a ring wall of rocks 10 to 12 feet in diameter. Four reference marks, each consisting of a drill hole in the rock, are just outside the wall at the following distances and azimuths from the stations: 2.56 meters, 38° 01′; 2.66 meters, 121° 28′; 4.25 meters, 204° 16′; and 3.32 meters, 309° 39′.

"Mount Nebo astronomic station, marked by a brick pier, is 23.25 meters (given 25.25 meters in latitude record) from the station in azimuth 321° 35′. The vertical circle station is 4.60 meters distant in azimuth 49° 00′. The latitude pier is partly surrounded by a square rock wall, and the vertical circle station by a circular wall similar to that about the station, but smaller."

The circular wall described above had been destroyed, and a rock cairn 7 feet in diameter at the base and 9 feet high was erected.

There is a road and trail from Mono, a station on the San Pedro, Los Angeles & Salt Lake Railroad, to station, but some of the trail is rather rough. There is a spring about halfway up the mountain, but very little feed. A snow bank was found about 400 feet below the summit on September 1.

[Latitude 39° 48′ 39.113″. Longitude 111° 45′ 56.918″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Scipio	39 20 57.40	219 04 05.85	4.7773613	37.214
Sevier	61 10 28.56	240 53 04.21	4.6483730	27.652
Sunrise	92 13 47.89	272 02 05.79	4.4166094	16.217
Maple	97 32 35.16	277 11 14.85	4.6804632	29.772
Bennion	106 30 43.85	286 00 56.61	4.8385542	42.845
Sabie	109 35 29.06	289 13 21.03	4.7173868	32.414
Boulter	120 19 31.61	300 02 57.42	4.6292985	26.464
Stookey	126 29 58.93	305 59 59.53	4.9151530	51.110
Deseret	134 47 27.68	314 14 12.20	5.0118874	63.861
Lava	144 07 56.91	323 53 02.51	4.7492308	34.880
Ant Hill	151 10 01.35	331 01 08.29	4.6099874	25.313
Herriman	151 47 03.20	331 30 20.33	4.8898558	48.218
Lake	163 48 07.66	343 41 13.55	4.7364366	33.868
Lone Peak	180 37 46.90	0 38 10.86	4.9006091	49.426
Santaquin	212 24 52.36	32 30 21.73	4.3565866	14.123
Spanish Fork	213 26 37.50	33 35 49.25	4.5674605	22.951
Springville	200 18 05.73	20 26 10.71	4.7107099	31.920
Salt Creek	352 59 15.16	173 00 08.52	4.2121034	10.126

ONAQUI, TOOELE COUNTY, UTAH. (Not occupied.)

A prominent peak in the Onaqui Range, located by the United States Coast Survey. It is about 10 miles west of Grantsville.

[Latitude 40° 36′ 10.481″. Longitude 112° 36′ 52.528″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Deseret	3 23 45.93	183 23 19.92	4.2019090	9.891
Herriman	298 58 43.77	119 14 57.76	4.6063886	25.104
South	318 11 46.96	138 18 02.73	4.2103835	12.698

PROVO, UTAH COUNTY, UTAH. (Not occupied.)

Small rock cairn on the northern of two peaks on south side of Provo River, 8 or 10 miles southeast of Provo.

[Latitude 40° 18′ 43.827″. Longitude 111° 35′ 18.193″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Lava	78 07 33.64	257 45 41.76	4.6905637	30.473
Herriman	103 53 58.97	283 30 17.21	4.7267679	33.122
Cedar Point	108 54 59.17	288 39 42.92	4.5472876	21.910

PROVO NO. 2, UTAH COUNTY, UTAH. (Not occupied.)

Southern of two peaks on the south side of Provo River, 8 or 10 miles northeast of Provo.

[Latitude 40° 18′ 26.057″. Longitude 111° 35′ 15.821″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Ant Hill	60 54 45.31	240 38 55.53	4.6004240	24.761
Lake	84 51 56.56	264 38 05.71	4.4838908	18.934
Cedar Point	109 43 28.40	289 28 10.66	4.5501625	22.055

ROUND TOP, TOOELE COUNTY, UTAH. (Not occupied.)

On the highest point of a group of hills in Skull Valley, about 15 or 20 miles west of Vernon, a post office in Rush Valley.

[Latitude 40° 08′ 10.193″. Longitude 112° 43′ 44.382″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Deseret	193 41 55.55	13 45 56.04	4.5681320	22.987
Stookey	231 37 43.99	51 44 56.30	4.3052294	12.548
Bennion	316 05 41.51	136 12 59.87	4.3674218	14.480

SABIE, TOOELE COUNTY, UTAH.

A lone peak covered with mahogany brush about 4 miles southwest of Lofgreen, a station on the San Perdo, Los Angeles & Salt Lake Railroad. The trees were cut from the summit. A party can camp at Lofgreen.

Signal and station mark: A mahogany tree 10 feet high supported by a rock cairn 6 feet in diameter at the base and 5 feet high. Azimuth from tree to tablet 289° 32′, distance 4.5 feet.

Reference mark: A triangulation tablet set in solid rock.

Instrument was set over center of tablet. The mountain is locally known as Sabie Peak and can be easily reached on horseback from any direction.

[Latitude 39° 58′ 01.132″. Longitude 112° 20′ 27.752″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Dutch	83 51 59.04	263 46 37.92	4.0768704	7.417
Bennion	96 42 30.41	276 34 50.71	4.2328388	10.622
Vernon	151 02 46.03	330 59 12.46	4.2107957	10.096
Stookey	151 15 41.06	331 07 52.86	4.4529603	17.632
Deseret	156 12 20.10	336 01 18.44	4.7770456	37.187
Centre	169 13 25.20	349 11 53.00	4.2587933	11.276
Herriman	193 23 09.43	13 28 41.49	4.7192358	32.553
Topliff	207 28 56.73	27 33 54.29	4.3749297	14.733
Lava	209 46 12.16	29 53 30.01	4.5102086	20.117
Lake	233 52 25.92	44 07 45.69	4.6870508	30.227
Boulter	251 40 52.19	71 46 26.98	4.1145377	8.089
Eureka	280 44 10.67	100 53 20.79	4.3160795	12.866
Nebo	289 13 21.03	109 35 29.06	4.7173868	32.414
Sunrise	305 10 04.43	125 20 29.33	4.4525140	17.614
Sevier	345 00 46.96	165 05 26.23	4.6047707	25.010
Maple	351 16 10.69	171 16 57.08	4.0539323	7.035

ST. JOHN, TOOELE COUNTY, UTAH. (No check; not occupied.)

Center of cupola on school building at St. John post office, in Rush Valley.

[Latitude 40° 21′ 23.227″. Longitude 112° 27′ 18.511″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Stookey	32 01 40.61	211 58 16.22	4.1486761	8.750
South	180 27 55.25	0 27 58.06	4.0835215	7.531

ST. JOHN RAILROAD STATION, TOOELE COUNTY, UTAH. (Not occupied. No check.)

Chimney in center of railroad station at St. John, on the San Pedro, Los Angeles & Salt Lake Railroad.

[Latitude 40° 22′ 00.280″. Longitude 112°24′ 35.689″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Stookey	40 52 32.86	220 47 23.10	4.2378595	10.745
South	161 12 04.58	341 10 21.73	4.0643992	7.207

SALT CREEK, JUAB COUNTY, UTAH. (Not occupied by United States Geological Survey.)

Rock cairn located by the United States Coast and Geodetic Survey. It is on a prominent mountain on south side of Salt Creek near the point where creek enters Juab Valley.

[Latitude 39° 39′ 54.642″. Longitude 111° 44′ 33.450″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Scipio	52 59 33.09	232 41 49.97	4.6994370	31.102
Bennion	117 43 39.02	297 13 01.04	4.8860569	47.798
Boulter	134 12 37.92	313 55 11.67	4.7327911	33.585
Nebo	173 00 08.52	352 59 15.16	4.2121034	10.126

SALT LAKE CITY CAPITOL, SALT LAKE COUNTY, UTAH. (Not occupied.)

Center of dome on the State Capitol in Salt Lake City.

[Latitude 40° 46′ 39.517″. Longitude 111° 53′ 15.295″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Lake	5 02 09.12	184 59 55.74	4.7422145	34.321
Cedar Point	11 10 04.25	191 06 24.52	4.6138882	25.541
Herriman	34 02 20.60	213 50 13.03	4.6728449	29.255

SANTAQUIN, UTAH COUNTY, UTAH. (Not occupied.)

On highest point of high mountain about 10 miles in an air line east of the town of Santaquin on the Utah Central Railroad.

[Latitude 39° 59′ 00.939″. Longitude 111° 37′ 23.413″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Nebo	32 30 21.73	212 24 52.36	4.3565866	14.123
Boulter	92 48 02.67	272 25 56.56	4.6901980	30.447
Ant Hill	117 29 30.25	297 15 05.76	4.5545058	22.277
Lake	140 31 53.82	320 19 27.98	4.6334999	26.721

SCIPIO, MILLARD COUNTY, UTAH. (Not occupied by the United States Geological Survey.)

Described in United States Coast and Geodetic Survey Special Publication 19, page 134, as follows:

"On the highest peak of the Canon Mountains, east of the town of Oak City, and northwest of the town of Scipio. The station is on the highest part of the summit,

about 10 or 12 feet from the edge of the abrupt slope on the eastern and northeastern side of the peak. The station is marked by a copper bolt set in a drill hole in solid rock. It is also marked, about 15 inches above the bolt, by a drill hole in a flat stone embedded in the top of a low masonry pier used for mounting the instrument. The station is nearly surrounded by a ring wall about 5 feet high, with an inner diameter of about 11 feet. Four reference marks, each a drill hole in solid rock, are just outside the wall at the following distances and azimuths from the station: 2.74 meters, 177° 55′; 2.77 meters, 284° 55′; 2.94 meters, 41° 33′; and 2.47 meters, 126° 51′."

[Latitude 39° 23′ 34.370″. Longitude 112° 12′ 23.783″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Bennion	156 36 04.12	336 23 18.09	4.8553038	44.530
Deseret	163 18 23.66	343 02 15.28	5.0926837	76.901
Herriman	180 21 34.21	0 21 53.79	5.0595560	71.270
Boulter	180 44 31.37	0 44 55.02	4.8314061	42.146
Lake	192 42 51.02	12 52 55.29	5.0053861	62.912
Nebo	219 04 05.85	39 20 57.40	4.7773613	37.214
Salt Creek	232 41 49.97	52 59 33.09	4.6994370	31.102

SCRUB, TOOELE COUNTY, UTAH. (Not occupied.)

Highest point on prominent peak about 20 miles a little north of east of Deseret triangulation station. There is scrub timber on the mountain, probably a summit of Cedar Mountains.

[Latitude 40° 32′ 15.053″. Longitude 112° 58′ 03.525″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Deseret	286 27 59.56	106 41 18.99	4.4806348	18.793
Stookey	311 29 19.21	131 45 50.06	4.6834330	29.977
Bennion	329 11 29.72	149 28 05.15	4.8534148	44.337

SEVIER, JUAB COUNTY, UTAH. (Not occupied.)

Tree or cairn on the highest of three rather prominent peaks. It is on the north side of the San Pedro, Los Angeles & Salt Lake Railroad, and about 16 miles in an air line north of Scipio triangulation station.

[Latitude 39° 37′ 00.211″. Longitude 112° 13′ 11.388″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Bennion	146 15 29.10	326 03 11.75	4.6919962	30.574
Sabie	165 05 26.23	345 00 46.96	4.6047707	25.010
Boulter	182 40 30.06	2 41 24.25	4.6336404	26.729
Nebo	240 53 04.21	61 10 28.56	4.6483730	27.652

SKULL, TOOELE COUNTY, UTAH. (Not occupied.)

Highest point of rather sharp peak in group of hills about 10 miles west of Bennion triangulation station; a flat-topped mountain north of peak is a little higher.

[Latitude 40° 00′ 16.314″. Longitude 112° 43′ 20.922″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Deseret	189 13 18.48	9 17 03.49	4.7094298	31.826
Stookey	209 22 02.76	29 28 59.36	4.4935103	19.358
Bennion	277 56 12.32	98 03 15.00	4.1974047	9.789

SMELTER, TOOELE COUNTY, UTAH. (No check; not occupied.)

Large chimney on smelter at foot of mountains east-northeast of town of Tooele.

[Latitude 40° 33′ 00.213″. Longitude 112° 13′ 27.101″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
South	64 22 00.86	244 13 03.53	4.3347827	13.432
Deseret	73 43 20.32	253 27 41.48	4.5499679	22.045

SOUTH, TOOELE COUNTY, UTAH.

On the westernmost summit of a low range of mountains connecting the Oquirrh Mountains and the Onaqui Range, about 6 miles west of Stockton, 6 miles south of Grantsville, and 10 miles north of St. John. The road from St. John to Grantsville passes about a mile and a half west of station at point where it crosses the divide. Can be easily reached on horseback from any direction.

Signal: A rock cairn 6 feet at base and 7 feet high.

Station mark: A United States Geological Survey tablet set in solid rock under center of cairn.

[Latitude 40° 27′ 56.218″. Longitude 112° 27′ 14.333″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
St. John	0 27 58.06	180 27 55.35	4.0835315	7.531
Clover	2 19 13.69	182 18 58.10	4.1466747	8.710
Bennion	7 49 05.54	187 45 46.03	4.7314782	33.483
Stookey	17 27 34.74	197 24 07.41	4.4017603	15.671
Deseret	87 31 09.86	267 24 28.66	4.1637472	9.059
Onaqui	138 18 02.73	318 11 46.96	4.3103835	12.698
Tooele	241 34 54.28	61 41 27.17	4.2092018	10.059
Smelter	244 13 03.53	64 22 00.86	4.3347827	13.432
Herriman	281 24 17.42	101 34 14.95	4.3453741	13.763
Lone Cedar	310 59 53.07	131 09 18.27	4.4360830	16.960
Lava	316 40 37.04	136 52 20.36	4.5733417	23.264
East Poplar	329 14 28.39	149 18 59.65	4.2861388	12.009
Boulter	336 46 00.60	156 55 59.75	4.7464506	34.658
St. John R. R. station	341 10 21.73	161 12 04.58	4.0643992	7.207
Faust	349 50 41.04	169 43 12.31	4.4893477	19.173
Center	350 34 17.27	170 37 07.55	4.5803847	23.645

SPANISH FORK PEAK, UTAH COUNTY, UTAH. (Not occupied.)

This point was located by the United States Coast and Geodetic Survey and is marked by a rock cairn. It was also occupied by a United States Geodetic Survey party in 1897. It is on the highest point of mountains between Hobble Creek and North Creek and about 6 miles in an air line southeast of Springville.

[Latitude 40° 05′ 17.553″. Longitude 111° 31′ 37.652″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Nebo	33 35 49.25	213 26 37.50	4.5674605	22.951
Boulter	80 53 20.55	260 27 30.52	4.7624765	35.961
Ant Hill	97 05 19.09	276 47 10.91	4.6052714	25.039
Lake	121 20 05.05	301 03 55.30	4.6187330	25.828
Herriman	123 30 51.78	303 04 50.77	4.8344067	42.438
Cedar Point	133 17 33.46	312 59 56.82	4.7240430	32.915
Lone Peak	158 21 27.93	338 12 36.10	4.7199045	32.603

SPRINGVILLE PEAK, UTAH COUNTY, UTAH. (Not occupied.)

On highest point of peak, about 5 miles east of Provo.

[Latitude 40° 14′ 40.528″. Longitude 111° 33′ 22.854″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Nebo	20 26 10.71	200 18 05.73	4.7107099	31.920
Boulter	64 05 28.10	243 40 43.36	4.7835758	37.751
Ant Hill	71 41 48.24	251 24 46.18	4.5965579	24.542
Lake	97 19 06.51	277 04 03.19	4.5222986	20.685

STOOKEY, TOOELE COUNTY, UTAH.

On the highest point of the Stansbury Mountains, south of Clover Creek, about 8 miles in an air line southwest of Clover post office. The nearest water and forage is at Alonzo S. Stookey's ranch, about 1 mile west of Clover post office. There is a road and trail from this ranch to summit of peak. There is a small spring three-quarters of a mile west of the peak, but grass is scarce on the mountain.

Signal: A rock cairn 6 feet at base and 7 feet high with spruce tree in center.

Station mark: A United States Geological Survey triangulation tablet set in solid rock under center of tree.

[Latitude 40° 14′ 56.084″. Longitude 112° 32′ 34.501″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Lookout	7 38 27.07	187 37 07.61	4.3417620	13.649
Skull	29 28 59.36	209 22 02.76	4.4935103	19.358
Round Top	51 44 56.30	231 37 43.99	4.3052294	12.548
Castle	68 50 01.00	248 34 00.60	4.5773784	23.482
Granite	78 02 47.07	257 34 37.03	4.8019684	39.384
Scrub	131 45 50.06	311 29 19.21	4.6834340	29.977
Tree	137 33 29.25	317 26 20.78	4.3642907	14.376
Deseret	163 18 33.45	343 15 20.46	4.3882959	15.193
South	197 24 07.41	17 27 34.74	4.4017603	15.671
St. John	211 58 16.22	32 01 40.61	4.1486761	8.750
Clover	214 47 28.32	34 50 39.83	4.0881213	7.612
St. John railroad station	220 47 23.10	40 52 32.84	4.2378595	10.745
Herriman	236 02 15.02	56 15 38.47	4.5475088	21.921
East Poplar	246 49 10.55	66 57 08.21	4.2781866	11.791
Lone Cedar	257 37 16.85	77 50 07.78	4.4598684	17.915
Lake	265 39 42.42	86 02 54.60	4.7078210	31.708
Lava	275 24 11.32	95 39 19.87	4.5238373	20.758
Topliff	289 58 08.14	110 10 55.67	4.4762747	18.605
Faust	295 37 37.31	115 43 34.98	4.1623178	9.030
Nebo	305 59 59.53	126 29 58.93	4.9151530	51.110
Boulter	312 32 49.19	132 46 13.34	4.6039360	24.962
Center	314 16 05.41	134 22 21.91	4.2853657	11.987
Sabie	331 07 52.86	151 15 41.06	4.4529603	17.632
Vernon	331 18 39.41	151 22 54.03	4.2895084	12.102
Bennion	359 28 46.63	179 28 53.87	4.4672738	18.223

SUNRISE, TOOELE AND JUAB COUNTIES, UTAH. (Not occupied.)

The highest point of a prominent, long mountain at the west end of Mead Valley and probably on county line between Juab and Tooele counties.

[Latitude 39° 49′ 10.600″. Longitude 112° 04′ 13.413″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Bennion	114 42 18.99	294 24 14.98	4.6447713	27.423
Sabie	125 20 29.33	305 10 04.43	4.4525140	17.614
Boulter	152 15 55.52	332 11 04.66	4.3637293	14.358
Nebo	272 02 05.79	92 13 47.89	4.4166094	16.217

TANK, UTAH COUNTY, UTAH. (Not occupied.)

Water tank on railroad between Lehi Junction and Topliff, about 2 miles east of Cedar Fort.

[Latitude 40° 18′ 56.853″. Longitude 112° 04′ 23.461″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Lava	32 17 32.85	212 14 29.00	4.1000052	7.823
Herriman	139 04 53.73	319 00 02.39	4.2092003	10.059
Cedar Point	215 24 48.47	35 28 22.52	4.1286278	8.356
Ant Hill	342 11 36.37	162 14 35.10	4.3309479	13.314

TIMPANAGOS FLAG, UTAH COUNTY, UTAH. (No check; not occupied.)

Metal flag near the summit of Timpanagos Mountain, a very high mountain about 12 miles east of Lehi. Flag was established by citizens of Pleasant Grove in 1915.

[Latitude 40° 23′ 27.875″. Longitude 111° 38′ 43.269″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Lake	64 39 15.12	244 27 37.82	4.4496181	17.497
Cedar Point	95 18 29.51	275 05 25.44	4.4570313	17.798

TOOELE, TOOELE COUNTY, UTAH. (No check; not occupied.)

Center of cupola on a building (probably school) in town of Tooele.

[Latitude 40° 32′ 05.546″. Longitude 112° 17′ 09.380″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
South	61 41 27.17	241 34 54.28	4.2092018	10.059
Deseret	73 58 11.63	253 44 57.28	4.4769088	18.632

TOPLIFF, TOOELE COUNTY, UTAH. (Not occupied.)

Center of derrick near water tank at railroad station and post office, Topliff.

[Latitude 40° 09′ 22.862″. Longitude 112° 12′ 45.439″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Sabie	27 33 54.29	207 28 56.73	4.3749297	14.733
Bennion	55 47 34.06	235 34 55.84	4.5288057	20.997
Center	77 28 07.62	257 21 37.19	4.1669933	9.127
Stookey	110 10 55.67	289 58 08.14	4.4762747	18.605
Lava	216 04 20.70	36 06 41.07	3.9412791	5.428
Boulter	355 18 12.30	175 18 50.08	4.2304960	10.564

VERNON, TOOELE COUNTY, UTAH. (Not occupied.)

Center of cupola on Mormon Church at Vernon, a post office in Rush Valley.

[Latitude 40° 05′ 41.955″. Longitude 112° 25′ 59.801″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Bennion	36 38 53.50	216 34 46.80	4.1830661	9.471
Stookey	151 22 54.03	331 18 39.41	4.2895084	12.102
Center	231 02 13.66	51 04 15.26	3.7594769	3.571
Boulter	296 32 11.18	116 41 20.07	4.3544334	14.053
Sabie	330 59 12.46	151 02 46.03	4.2107957	10.096

Y, UTAH COUNTY, UTAH. (Not occupied.)

Bottom of a large "Y" placed on side of mountain by students of Brigham Young College, in Provo. It is just above the town of Provo.

[Latitude 40° 14′ 54.448″. Longitude 111° 37′ 14.161″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Boulter	61 12 44.52	240 50 28.79	4.7489157	34.855
Ant Hill	68 07 20.64	247 52 47.81	4.5379087	21.442
Cedar Point	121 07 48.42	300 53 47.82	4.5535612	22.229

UTAH AND IDAHO.

TRIANGULATION STATIONS.

Logan quadrangle.

CACHE AND RICH COUNTIES, UTAH; ONEIDA COUNTY, IDAHO.

During the field season of 1913 triangulation was extended over part of Cache County, Utah, by H. H. Hodgeson. The old stations, Swan Creek and Red Spot (see pp. 134, 135), both in Rich County, were occupied as base stations.

The following positions were computed on North American datum, accepting the azimuth and distance Swan Creek to Red Spot given in Bulletin 496 (pp. 354, 355).

BEAVER, CACHE COUNTY, UTAH. (Not occupied; unchecked.)

Summit near point of ridge between Beaver and Logan creeks and about 0.7 mile north from the junction of these creeks. Elevation above sea, 8,845 feet.

[Latitude 41° 57′ 50.9″. Longitude 111° 33′ 27.0″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Logan Peak	25 32 43	205 26 20	4.48851	19.14
Naomi	59 09 06	239 04 24	4.05430	7.04

BERGESON, CACHE COUNTY, UTAH.

On summit of bare hill about 3 miles southwest from Cornish Railroad station on land belonging to Ephraim Bergeson and locally known as Bergeson Hill. This station can be easily reached by road and trail from the ranch of Ephraim Bergeson, which is located about 2 miles south of Cornish Railroad station. Can take animals to station. Approximate elevation above sea 6,000 feet.

Signal: Six-foot cairn directly over station mark.

Station mark: Bronze triangulation tablet cemented in rock.

Reference marks: Cross cut in quartz rock 54.7 feet distant from center in true azimuth 124° 22′; cross cut in quartz rock 69.3 feet distant from center in true azimuth 147° 00′. Distance between witness marks is 28.3 feet.

[Latitude 41° 59′ 38.94″. Longitude 111° 59′ 58.99″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Wellsville	1 37 50 81	181 37 18.96	4.5893712	24.139
Naomi	288 38 56.78	108 51 58.88	4.4541738	17.682
Logan Peak	322 53 26.53	143 04 45.48	4.5909419	24.227
Newton			4.04870	6.95
Logan College			4.50600	19.92
Logan Temple			4.50770	20.00
Cache Junction elevator			4.24263	10.86
Smart Mountain			4.17364	9.27
T. 14 N., Rs. 1 E. and 1 W. Salt Lake meridian, crossroads at corner to secs. 13, 18, 19, and 24			4.00733	6.32

CACHE JUNCTION ELEVATOR, CACHE COUNTY, UTAH. (Not occupied.)

Center of gray-roofed elevator at Cache Junction, Utah.
Signal and station mark: Center of elevator.

[Latitude 41° 50′ 12.4″. Longitude 112° 00′ 13.6″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Wellsville	2 03 27	182 03 05	4.32972	13.28
Logan Peak	299 42 09	119 53 36	4.43888	17.07
Naomi			4.45571	17.74
Bergeson			4.24263	10.86

LOGAN COLLEGE, CACHE COUNTY, UTAH. (Not occupied.)

Spire on main building of Utah State College at Logan.
Signal: Center of spire.

[Latitude 41° 44′ 28.0″. Longitude 111° 48′ 49.8″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Wellsville	57 09 28	237 01 31	4.29552	12.27
Logan Peak	290 34 37	110 38 28	3.93464	5.35
Bergeson			4.50600	19.92

CLARKSTON, CACHE COUNTY, UTAH. (Not occupied; unchecked.)

North summit of Clarkston Mountains about 8 miles west from the town of Clarkston. Approximate elevation above sea, 8,245 feet.
Signal: Apparent highest point of summit.

[Latitude 41° 55′ 28.7″. Longitude 112° 07′ 37.1″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Naomi	272 01 52	92 19 58	4.57451	23.33
Logan Peak	304 22 04	124 38 29	4.61623	25.68

LOGAN PEAK, CACHE COUNTY, UTAH.

On summit of Logan Peak, on south side of Logan River and about 7 miles southeast from the city of Logan. This station can easily be reached from Logan River by road and log slides up Spring Creek. The nearest water is in the head of Providence Canyon, just south of station. Elevation of Logan Peak is 9,723 feet. Can take animals to station.

Signal: Bushy top pine guyed by wires. Limestone cairn around base of pine and the guy wires are anchored by stone mounds.

Station mark: Bronze triangulation tablet cemented in limestone rock and directly beneath signal.

Reference marks: Cross cut in limestone rock 40.7 feet distant from center, true azimuth 261° 31′. Cross cut in limestone rock 46.7 feet distant from center, true azimuth 37° 09′.

[Latitude 41° 42′ 49.88″. Longitude 111° 43′ 01.43″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Sharp	1 38 18	181 37 54	4.47482	18.54
Tit	9 55 56	189 52 56	4.56015	22.57
Wellsville Tabernacle	64 45 17	244 36 43	4.29649	12.30
Wellsville	72 44 37.44	252 32 49.04	4.4118940	16.042
T. 11 N., R. 1 W. Salt Lake meridian, northwest corner of sec. 27	76 13 46	256 04 32	4.29770	12.33
T. 11 N., R. 1 W. Salt Lake meridian, north corner of secs. 1 and 2	96 04 44	275 57 01	4.20924	10.06
Tps. 11 and 12 N., Rs. 1 E. and 1 W. Salt Lake meridian, corner to	96 43 30	276 36 33	4.16454	9.08
Logan Temple	104 01 08	283 56 44	3.97671	5.89
Logan College	110 38 28	290 34 37	3.93464	5.35
Narrows	117 40 54	297 27 46	4.48895	19.16
Cache Junction elevator	119 53 36	299 42 09	4.43888	17.07
Clarkston	124 38 29	304 22 04	4.61623	25.68
Bergeson	143 04 45.48	322 53 26.53	4.5909419	24.227
T. 14 N., Rs. 1 E. and 1 W. Salt Lake meridian, crossroads at corner to secs. 13, 18, 19, and 24	150 24 04	330 16 58	4.47418	18.52
Smart Mountain	165 34 19	345 29 59	4.55594	22.35
Naomi	189 04 26.85	9 06 08.41	4.3475412	13.832
Beaver	205 26 20	25 32 43	4.48851	19.14
Swan Creek	215 09 59.71	35 20 05.09	4.5595565	22.538
Red Spot	289 32 04.28	109 44 15.92	4.4317904	16.794

LOGAN TEMPLE, CACHE COUNTY, UTAH. (Not occupied.)

West spire on Mormon Temple in city of Logan, Utah.
Signal and station mark: Center of west spire.

[Latitude 41° 44′ 04.1″. Longitude 111° 49′ 39.3″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Wellsville	57 08 57	237 01 33	4.26449	11.42
Logan Peak	283 56 44	104 01 08	3.97671	5.89
Bergeson			4.50770	20.00

NAOMI, CACHE COUNTY, UTAH.

On highest point of rocky, limestone mountain (occupied by the Wheeler Survey) locally known as Naomi Peak. At head of Smithfield and Tony Grove canyons, about 9 miles northeast from town of Smithfield, Cache County, Utah. This station overlooks Cache Valley. Best route to peak is up Tony Grove Creek (by trail from Tony Grove ranger station) to within 1.5 miles of its head, thence south into saddle and follow ridge to station. Can take animals to within half a mile of station. Elevation above sea, 9,980 feet.

Signal: Bushy top pine set in mound of stone and directly over station mark.

Station mark: Bronze triangulation tablet cemented in limestone rock at center of mound built by Wheeler Survey.

Reference marks: Cross cut in limestone rock 17.1 feet distant from center, true azimuth 247° 50′. Cross cut in limestone rock 18.2 feet distant from center, true azimuth 353° 44′.

[Latitude 41° 54′ 42.35″. Longitude 111° 40′ 29.09″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Logan Peak	9 06 08.41	189 04 26.85	4.3475412	13.832
Wellsville	43 33 58.44	223 20 27.17	4.6115960	25.407
Newton	86 19 42	266 08 15	4.37652	14.79
Clarkston	92 19 58	272 01 52	4.57451	23.33
Bergeson	108 51 58.88	288 38 56.78	4.4541738	17.682
Beaver	239 04 24	59 09 06	4.05430	7.04
Swan Creek	246 13 09.80	66 21 34.52	4.2786645	11.804
Red Spot	324 43 52.93	144 54 24.51	4.5798491	23.616
Cache Junction elevator			4.45571	17.74
Narrows			4.50172	19.73
Wellsville Tabernacle			4.57057	23.12
T. 11 N., R. 1 W., northwest corner of sec. 27			4.54540	21.81
T. 11 N., R. 1 W., north corner of secs. 1 and 2			4.45028	17.52
Tps. 11 and 12 N., Rs. 1 E. and 1 W., corner of			4.43328	16.85

NARROWS, CACHE COUNTY, UTAH. (Not occupied.)

Summit of a rocky hill on north side of Bear River at Cache Junction Narrows, about 5 miles northwest of Cache Junction, Utah. Approximate elevation above sea, 5,500 feet.

Signal: Apparent highest point of hill.

[Latitude 41° 50′ 32.4″. Longitude 112° 02′ 44.8″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Logan Peak	297 27 46	117 40 54	4.48895	19.16
Wellsville	352 54 34	172 55 53	4.34514	13.76
Naomi			4.50172	19.73

NEWTON, CACHE COUNTY, UTAH. (Not occupied.)

On bare summit of Newton Hill, about 2 miles northeast from town of Newton and 2 miles southwest from town of Trenton. Approximate elevation above sea, 5,700 feet.

Signal: Tripod 12 feet high, 2 by 4 inch, with targets.

Station mark: None.

[Latitude 41° 43′ 51.7″. Longitude 111° 57′ 39.3″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Wellsville	8 46 09	188 44 05	4.45408	17.68
Naomi	266 08 15	86 19 42	4.37652	14.79
Bergeson			4.04870	6.95

RED SPOT, RICH COUNTY, UTAH.

On rather high flat-topped ridge at source of Old Canyon Creek, a stream flowing into Bear River. It is about 12 miles a little south of west of Randolph. Station can be reached by road up Old Canyon 7 or 8 miles, thence on horseback the best way you can find up ridge. Numerous quaking asp trees to go through. It can also be reached by going up the Logan road, or from the north by going by the Twin Peaks on horseback.

Signal: A cairn 6 feet high with tree in center.

Station mark: A triangulation tablet set in rock under center of cairn.

[Latitude 41° 37′ 55.49″. Longitude 111° 24′ 41.02″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Sharp	51 54 01	231 41 27	4.52562	20.84
Wellsville	91 46 42.99	271 42 44.02	4.7002198	31.158
Logan Peak	109 44 15.92	289 32 04.28	4.4317904	16.794
Naomi	144 54 24.51	324 43 52.93	4.5798491	23.616
Swan Creek	173 27 04.71	353 24 56.06	4.5905941	.....
Lakeview	202 18 41.01	22 25 54.81	4.5964006	.....
South Twin	209 18 49.69	29 21 55.86	4.1210225	.....
Red	216 44 55.03	36 59 58.54	4.7169770	.....
Nugget	258 15 58.51	78 39 24.61	4.6983003	.....
Randolph	258 50 18.49	78 59 20.87	4.2843303	.....
Rex	264 03 42.43	84 16 23.13	4.4253802	.....
Limestone	283 04 49.60	103 12 05.02	4.1927773	.....
Woodruff	300 48 12.21	120 58 06.11	4.3830813	.....

SHARP, CACHE COUNTY, UTAH. (Not occupied.)

Sharp timbered west summit of mountain off south edge Logan quadrangle.

Signal: Apparent highest point.

[Latitude 41° 26′ 43.0″. Longitude 111° 43′ 38.2″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Logan Peak	181 37 54	1 38 18	4.47482	18.54
Red Spot	231 41 27	51 54 01	4.52562	20.84
Swan Creek	.....	.....	4.80160	39.35

SMART MOUNTAIN, ONEIDA COUNTY, IDAHO. (Not occupied.)

The summit of a low mountain locally known as Mount Smart,[1] about 2 miles northwest from town of Franklin, Idaho. Approximate elevation above sea, 5,215 feet.

Signal: Large permanent flagpole.

Station mark: Large permanent flagpole.

[Latitude 42° 01′ 38.8″. Longitude 111° 49′ 31.0″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Wellsville	20 11 44	200 04 13	4.65608	28.15
Logan Peak	345 29 59	165 34 19	4.55594	22.35
Bergeson	.....	.....	4.17364	9.27

SWAN CREEK, RICH COUNTY, UTAH.

On highest point of timbered mountain at source of Swan Creek and just above Garden City on Bear Lake. There are higher mountains west of this point.

Signal: A tree trimmed up.

Station mark: A triangulation tablet set in rock 0.7 meter south-southeast from signal.

[Latitude 41° 58′ 49.93″. Longitude 111° 27′ 54.01″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Logan Peak	35 20 05.09	215 09 59.71	4.5595565	22.538
Naomi	66 21 34.52	246 13 09.80	4.2786645	11.804
Sharp	.....	.....	4.80160	39.35
Lakeview	276 21 25.74	96 30 50.08	4.2912251	.....
South Twin	338 05 27.40	158 10 42.99	4.4667274	.....
Redspot	353 24 56.06	173 27 04.71	4.5905941	.....

[1] See p. 173.

TIT, CACHE COUNTY, UTAH. (Not occupied.)

The timbered west summit of a mountain group known in the vicinity of Logan as the Eastern Range.

Signal: Apparent highest point.

[Latitude 41° 23′ 30.3″. Longitude 111° 47′ 31.2″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Wellsville	146 45 56	326 37 08	4.52620	20.87
Logan Peak	189 52 56	9 55 56	4.56015	22.57
Bergeson			4.83950	42.94

T. 11 N., R. 1 W. SALT LAKE MERIDIAN, CACHE COUNTY, UTAH. (Three-point station; unchecked.)

North corner to secs. 1 and 2. Unmarked stone in place.

Station mark: Section corner stone.

[Latitude 41° 43′ 44.9″. Longitude 111° 54′ 38.0″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Wellsville	42 15 39	222 11 34	4.10346	7.89
Logan Peak	275 57 01	96 04 44	4.20924	10.06
Naomi			4.45028	17.52

T. 14 N., RS. 1 E. AND 1 W. SALT LAKE MERIDIAN, CACHE COUNTY, UTAH. (Three-point station; checked.)

Center of crossroads at corner of secs. 13, 18, 19, and 24.

Station mark: None.

[Latitude 41° 56′ 49.2″. Longitude 111° 53′ 40.4″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Wellsville	16 22 19	196 17 35	4.54415	21.75
Logan Peak	330 16 58	150 24 04	4.47418	18.52
Bergeson			4.00733	6.32

T. 11 N., R. 1 W. SALT LAKE MERIDIAN, CACHE COUNTY, UTAH. (Three-point station; unchecked.)

Northwest corner of sec. 27. No stone in place.

Station mark: None.

[Latitude 41° 40′ 15.9″. Longitude 111° 56′ 54.7″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Wellsville	61 13 44	241 11 10	3.78718	3.81
Logan Peak	256 04 32	76 13 46	4.29770	12.33
Naomi			4.54540	21.81

TPS. 11 AND 12 N., RS. 1 E. AND 1 W. SALT LAKE MERIDIAN, CACHE COUNTY, UTAH. (Three-point station; unchecked.)

Unmarked stone in place.

Station mark: Township corner stone.

[Latitude 41° 43′ 44.9″. Longitude 111° 53′ 29.0″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Wellsville	47 10 17	227 05 26	4.14028	8.58
Logan Peak	276 36 33	96 43 30	4.16454	9.08
Naomi			4.43328	16.85

WELLSVILLE, CACHE COUNTY, UTAH.

On bare cone (north summit) of Wellsville Mountains, about 5 miles west from town of Wellsville. First summit north from saddle at head of Brushy Canyon. This station can easily be reached by going up Red Point Ridge from the town of Wellsville (this ridge separates Pine and Brushy canyons) to within 1,000 feet of the summit, the trail then leads into Brushy Canyon and up the canyon to the saddle, thence north to station. Small but excellent spring at head of Brushy. Can take animals to station. Approximate elevation above sea, 9,355 feet.

Signal: Six-foot cairn directly over station mark.

Station mark: Bronze triangulation tablet cemented in limestone rock.

Reference marks: Cross cut in limestone rock 20.15 feet distant from center, true azimuth 303° 38′. Cross cut in limestone rock 109.0 feet distant from center, true azimuth 32° 51′.

[Latitude 41° 38′ 40.28″. Longitude 112° 00′ 46.76″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Narrows	172 55 53	352 54 34	4.34514	13.76
Bergeson	181 37 18.96	1 37 50.81	4.5893712	24.139
Cache Junction elevator	182 03 05	2 03 27	4.32972	13.28
Newton	188 44 05	8 46 09	4.45408	17.68
T. 14 N., Rs. 1 E. and 1 W. Salt Lake meridian, crossroads at corner of secs. 13, 18, 19, 24	196 17 35	16 22 19	4.54415	21.75
Smart Mountain	200 04 13	20 11 44	4.65608	28.15
T. 11 N., R. 1 W. Salt Lake meridian, north corner of secs. 1 and 2	222 11 34	42 15 39	4.10346	7.89
Naomi	223 20 27.17	43 33 58.44	4.6115960	25.407
Tps. 11 and 12 N., Rs. 1 E. and 1 W. Salt Lake meridian, corner to	227 05 26	47 10 17	4.14028	8.58
Logan College	237 01 31	57 09 28	4.29552	12.27
Logan Temple	237 01 33	57 08 57	4.26449	11.42
T. 11 N., R. 1 W. Salt Lake meridian, northwest corner sec. 27	241 11 10	61 13 44	3.78718	3.81
Logan Peak	252 32 49.04	72 44 37.44	4.4118940	16.042
Red Spot	271 42 44.02	91 46 42.99	4.7002198	31.158
Wellsville Tabernacle	276 25 23	96 28 37	3.83233	4.22
Tit	326 37 08	146 45 56	4.52620	20.87

WELLSVILLE TABERNACLE, CACHE COUNTY, UTAH. (Not occupied.)

Spire on Mormon Tabernacle in town of Wellsville, Utah.

Signal: Center of spire.

[Latitude 41° 38′ 15.6″. Longitude 111° 55′ 54.9″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Wellsville	96 28 37	276 25 23	3.83233	4.22
Logan Peak	244 36 43	64 45 17	4.29649	12.30
Naomi			4.57057	23.12

COLORADO AND WYOMING.

TRIANGULATION STATIONS.

Boulder 15′, Eagle, Glenwood Springs, Home, Jackson, James Peak, Kremmling, Leadville, Leon Peak, Longs Peak, Mount Powell, North Park, Pagoda, Rabbit Ears, Rifle, and Snow Mass quadrangles, Colo.; Laramie and Sherman quadrangles, Wyo.

BOULDER, DELTA, EAGLE, GARFIELD, GRAND, GUNNISON, JACKSON, LARIMER, MESA, PITKIN, RIO BLANCO, ROUTT, AND SUMMIT COUNTIES, COLO.; ALBANY AND LARAMIE COUNTIES, WYO.

For this work 8 old stations were reoccupied, 34 new positions determined, and 20 secondary points cut in. The field work on the Boulder, James Peak, Longs Peak, and Mount Powell quadrangles was done by C. F. Urquhart during the season of 1913. That for the Eagle, Glenwood Springs, Mount Jackson, Kremmling, Leadville, Leon Peak, Pagoda, Rabbit Ears, Rifle, and Snow Mass was done by C. B. Kendall during the season of 1914.

During the season of 1915, C. B. Kendall did the field work on the Laramie and Sherman quadrangles in Wyoming and the Home and North Park quadrangles in Colorado.

Positions are based on the United States Coast and Geodetic Survey stations Horsetooth-Twin, and are carried south and west to a tie with positions based on United States Coast and Geodetic Survey stations Tavaputs, Mount Waas at Leon Peak, and North Mam and with triangulation from the north at North Mam and Rio Blanco. A tie was also made with previous work at stations Hogback, Sugarloaf on the east and Holy Cross on the south.

ARAPAHOE, BOULDER-GRAND COUNTIES, COLO.

Arapahoe Mountain is on the line between Boulder and Grand counties, Colo. It is at the source of Boulder Creek and the highest of several peaks in the vicinity. There is a wagon road from Eldora to the summit of the range or the county line and a trail on the west side. This road crosses the range about 2 miles south of the peak. Parties can camp at an old mine on the east side of the range at timber line. From this mine a trail goes east up the ridge, then north and west to the summit of a high mountain northeast of the mine. From summit of this mountain go west and north along rough ridge to peak.

Station mark: A rock monument 8½ feet high and 31 feet in circumference is on highest point of peak. There is a copper tablet in center of large flat rock on top of monument, stamped "Erected by the City of Boulder in 1910—Mann & Heinze."

Reference mark: Bronze tablet set in solid rock 10.76 feet east of signal; true azimuth 280° 03′ 53″.

[Latitude 40° 01′ 36.038″. Longitude 105° 38′ 59.196″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Ptarmigan	40 55 54.52	220 41 26.94	4.6922537	30.592
Byers	54 45 28.48	234 34 02.18	4.4928574	19.329
Elk	110 24 03.49	290 05 35.01	4.6380472	27.002
Parkview	129 19 53.27	309 01 04.89	4.7273518	33.167
Richthofen	157 09 32.33	337 00 03.85	4.7275240	33.180
Hague	180 22 41.58	0 22 50.79	4.7062917	31.597
Longs Peak	186 44 58.07	6 46 19.98	4.4073647	15.875
Hogback	238 45 56.46	59 03 27.14	4.6538537	28.003
Bald	246 43 47.35	66 47 33.67	3.9578731	5.639
Sugarloaf	269 50 30.50	89 59 27.02	4.2962388	12.291

BALD MOUNTAIN, BOULDER COUNTY, COLO.

High, round-topped peak (end of spur from Continental Divide) 4 miles southwest of Ward, Colo. Locally known as Bald Mountain.

Station mark: Aluminum tablet under rock monument.

[Latitude 40° 03′ 32.141″. Longitude 105° 33′ 07.424″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Arapahoe	66 47 33.67	246 43 47.35	3.9578731	5.639
Longs Peak	166 18 14.26	346 15 49.34	4.3508207	13.937
Twin	186 41 23.57	6 42 45.28	4.4096472	15.959
Lillie	187 24 10.80	7 25 38.93	4.3987818	15.564
Sugarloaf	287 12 38.19	107 17 48.57	4.0782957	7.441

BLACK, LARIMER COUNTY, COLO. (Not occupied.)

On highest part of Black Mountain which lies between the North Fork of Lone Pine Creek and Sheep Creek, about 8 miles west of Cherokee Park.

Station and signal: Highest tree on top of mountain.

[Latitude 40° 52′ 19.4″. Longitude 105° 38′ 17.1″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
North Bald	25 39 16.6	205 36 54.2	4.07197	7.34
Little Bald	81 34 13.9	261 29 34.8	4.00428	6.28
Bull	107 09 02.8	287 01 21.2	4.23719	10.73
Dead Tree	183 27 40.7	3 27 57.0	3.99174	6.10
Gale	191 56 29.6	11 58 23.6	4.29299	12.20
Cap Rock	233 36 24.7	53 43 43.9	4.28949	12.10

BUFFALO, GRAND-JACKSON COUNTIES, COLO. (Not occupied.)

On Buffalo Mountain, a peak of the east branch of the Park Range, on the Continental Divide and on line between Grand and Jackson counties, at the head of the West Fork of Troublesome Creek on the south and Arapahoe Creek on the north, about 12 miles west of Parkview Mountain and 25 miles north of the town of Kremmling on the Denver & Salt Lake (Moffat) Railroad.

Station mark and signal: Rock cairn on highest point.

[Latitude 40° 21′ 40.1″. Longitude 106° 15′ 54.6″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Kremmling	11 20 37	191 17 16	4.57584	23.40
Rabbit Ears	104 09 53	283 56 28	4.48005	18.77
Parkview	287 13 13	107 18 15	4.06171	7.16
Elk	332 05 20	152 10 40	4.39787	15.54

BULL, LARIMER COUNTY, COLO.

On the highest part of Bull Mountain which lies between Larimer River and Sand Creek and just south of where the Boulder Ridge road crosses the "Sand Gap," from which place the station can be reached by saddle animals. The mountain is heavily timbered on the southwest end and has dead trees on the extreme top.

Signal: Pine tree nailed in fork of a large dead pine. White cloth was tacked on the trunk of the dead tree.

Station mark: Bronze tablet in sandstone set 2 feet in the ground 2.65 feet southwest of signal; true azimuth 18° 00′.

[Latitude 40° 55′ 04.18″. Longitude 105° 50′ 01.80″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Shipman	64 18 38.45	244 09 04.88	4.3577621	14.162
Red	135 17 40.50	315 13 43.27	4.0800898	7.472
Jelm	148 57 45.15	328 52 08.02	4.3665273	14.450
Gale	235 23 59.04	55 33 35.26	4.3967232	15.491
Dead Tree	254 30 45.53	74 38 44.00	4.2484522	11.010
Black	287 01 21.2	107 09 02.8	4.237191	10.73
Little Bald	315 11 50.18	135 14 52.38	3.9662174	5.749

BYERS, GRAND COUNTY, COLO.

This station is on the highest point of Byers Peak, a fairly well known point on the range between Williams River and Fraser Creek at the source of Rough Gulch. There is a trail from the Horseshoe ranger station on Williams River up Rough Gulch and across the ridge to Fraser, a small town on Denver & Salt Lake Railroad. This trail across ridge is about 1.5 miles north of the peak. From the summit of ridge horses can be ridden along ridge south to within a very short distance of station.

Signal: A rock cairn 6 or 7 feet at base and 8 feet high.

Station mark: Hole in solid rock 6.4 feet west of signal; true azimuth 87° 39′.

[Latitude 39° 51′ 52.680″. Longitude 105° 56′ 48.103″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Ptarmigan	19 24 03.73	199 21 01.52	4.3102188	12.693
Holy Cross	46 15 54.32	225 55 26.33	4.8037768	39.548
Ute	51 47 46.36	231 42 46.97	4.1509118	8.796
Powell	71 10 08	250 55 02	4.55147	22.12
Eagles Nest	74 11 23	253 55 57	4.55469	22.29
Piney	83 59 51.80	263 38 43.17	4.6753682	29.425
Lone Peak	92 19 30.83	272 00 50.78	4.6185878	25.819
Kremmling	117 51 22.83	297 35 46.05	4.5924932	24.313
Elk	154 57 53.03	334 50 53.68	4.5619737	22.663
Parkview	162 45 29.24	342 38 11.23	4.7336831	33.654
Arapahoe	234 34 02.18	54 45 28.48	4.4928574	19.329

CAP ROCK, LARIMER COUNTY, COLO.

On the easternmost of three large rocks which form the summit of "Cap Rock," a well-known peak which lies just south of Fish Creek and about 3 miles southeast of Mr. Edwin Shaffer's ranch and residence and about 7 miles by road northwest of Virginia Dale stage station. Can be easily reached by taking road to south about ½ mile east of Mr. Shaffer's residence to foot of peak. Climb peak from the south end.

Signal: A pole quadripod with flags.

Station mark: Bronze tablet in solid rock under signal.

[Latitude 40° 58′ 32.97″. Longitude 105° 27′ 06.90″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
North Bald	43 15 55.54	223 06 13.75	4.4831240	18.901
Black	53 43 43.9	233 36 24.7	4.28949	12.10
Dead Tree	83 31 10.86	263 24 08.14	4.1811197	9.429
Diamond	92 32 30	272 28 17	3.95602	5.615
Gale	123 35 01.77	303 29 36.10	4.1434427	8.646
Twin	242 31 07.75	62 38 23.72	4.2427743	10.867
Livermore	330 51 55.97	150 58 13.12	4.4436084	17.257

CASTLE, EAGLE COUNTY, COLO.

In T. 3 S., R. 84 W., near north-south line between secs. 19 and 20. Station is on the highest (second from the east) of four large cliff-like rocks which are on the southeast end of Castle Mountain, a well-known peak at the head of Castle Creek, 9 miles due north of Eagle, a town on the Denver & Rio Grande Railroad. Can be best reached by wagon road from Eagle up Castle Creek to ranger station, thence by ranger trail to station. Animals can be ridden to foot of cliff about 0.25 mile south of station.

Station mark: A bronze triangulation tablet set in solid rock 8.5 feet northeast of signal; true azimuth 246° 09′.

Signal: A United States Forest Service fire lookout telephone tripod of hewn poles with United States flag at top. Tripod is weighted at the north end by a heap of stones.

[Latitude 39° 46′ 20.991″. Longitude 106° 49′ 46.922″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Sopris	26 59 00.42	206 46 14.44	4.8035053	39.523
Lookout	55 59 36.47	235 42 45.71	4.65917	28.35
Quartzite	75 36 59.95	255 18 17.73	4.6355323	26.846
Limestone	91 10 49.95	270 48 03.61	4.70614	31.59
Shingle	114 06 05	293 51 58	4.54688	21.89
Flattop	141 18 45.04	321 09 01.27	4.5382436	21.458
Rabbit Ears	194 21 56.40	14 30 25.30	4.8754314	46.643
Parkview	223 29 45.17	43 56 33.10	4.9329814	53.252
Kremmling	235 00 36.36	55 18 59.57	4.6970212	30.929
Piney	259 41 23.38	79 54 10.57	4.4620398	18.005
Holy Cross	318 26 59.35	138 40 19.66	4.6554340	28.105
Red Table	349 11 19	169 14 38	4.60021	24.75

CHAIR, GUNNISON COUNTY, COLO. (Not occupied.)

On Chair Mountain, a well-known point on west side of Rock Creek about 3 miles southwest of Prospect.

Signal and station mark: Large rock monument on highest point.

[Latitude 39° 03′ 29.9″ (K); 39° 03′ 24.0″ (D). Longitude 107° 16′ 53.5″ (K); 107° 17′ 00.6″ (D).]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Leon	92 58 08	272 36 53	4.68750	30.26
North Mam	125 03 57	305 41 48	4.79404	38.67
Divide	147 25 06	327 16 30	4.56391	22.765
Sunlight	168 20 26	348 16 43	4.61954	25.88
Sopris	(K)204 11 27	54 15 54	4.39324	(K)15.37
Sopris	(D)204 11 27.5	24 15 54	4.393718	(D)15.384

NOTE.—K=value obtained by Kendall from the north; D=value obtained by Douglas from the south. (See Bull. 122, p. 289.)

CLARK, LARIMER-JACKSON COUNTIES, COLO. (Not occupied.)

On highest point of Clarks Peak which is the highest peak of the Medicine Bow Range and is about 5 miles west of Chambers Lake.

Signal and station mark: Rock cairn.

[Latitude 40° 36′ 25.22″. Longitude 105° 55′ 45.66″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Shipman	153 06 59.48	333 01 12.02	4.4409279	17.151
Little Bald	207 31 39.13	27 38 25.18	4.4987823	19.594
North Bald	225 58 53.99	46 07 54.99	4.4323100	16.814
Hague	299 24 34.80	119 35 38.32	4.4408578	17.148
Richthofen	348 56 20.91	168 57 43.19	4.1915898	9.659

DEAD TREE, LARIMER COUNTY, COLO.

On the highest of several peaks forming the ridge lying at the headwaters of Trail Creek and between that creek and Sheep Creek. The ridge is fire scarred, leaving many dead trees, from which fact the station derived its name. Station is about 3 miles south of the Boulder Ridge road at a point about 3 miles east of the Eaton Dam and Reservoir. A road leads from this point to the foot of ridge, which can be easily ascended by following tie trails.

Station mark: A bronze tablet in solid rock over which is erected a rock cairn 7 feet high with tree and flagpole in center.

Signal: The cairn.

[Latitude 40° 57′ 36.95″. Longitude 105° 37′ 51.64″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Black	3 27 57.0	183 27 40.7	3.99174	6.10
North Bald	15 38 57.35	195 36 17.49	4.3270751	13.195
Little Bald	43 11 42.20	223 06 46.30	4.1892380	9.607
Bull	74 38 44.00	254 30 45.53	4.2484522	11.010
Red	98 37 50.30	278 25 54.15	4.4119216	16.042
Jelm	117 43 48.71	297 30 12.12	4.5158409	20.379
Gale	200 13 00.16	20 14 37.57	4.0014830	6.235
Ames	225 52 43	46 01 55	4.43625	19.97
Diamond	250 30 44	70 33 33	3.80673	3.98
Cap Rock	263 24 08.14	83 31 10.86	4.1811197	9.429

DIAMOND, LARIMER COUNTY, COLO. (Not occupied.)

A well-known rocky peak locally known as "Diamond Rock." It is on the west side of the Cherokee Park-Tie Siding road and probably lies between Trail Creek and Sheep Creek.

Signal and station mark: Highest part of peak.

[Latitude 40° 58′ 46.0″. Longitude 105° 33′ 33.2″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Dead Tree	70 33 33	250 30 44	3.80673	3.98
Gale	160 34 22	340 33 10	3.88797	4.81
Cap Rock	272 28 17	92 32 30	3.95602	5.615

DIVIDE, MESA COUNTY, COLO.

In T. 8 S., R. 91 W., near the southeast corner of township, on the highest point of ridge between East Divide and West Divide creeks, about 4 miles east of the Johnson Springs ranger station on West Divide Creek. Can be easily reached from Rifle or New Castle by wagon road up West Divide Creek to a point 1 mile north of Johnson Spring ranger station whence a good ranger's trail leads across the mountain into East Divide Creek. Follow trail east up mountain to where it reaches summit, then follow cattle trail southeast, keeping on up and out of timber. Station is on the second top north of the head of Mosquito Creek.

Station mark: A bronze tablet set in solid rock over which was erected a cairn 7 feet high.

Signal: A cairn 7 feet high with pole and flag in center.

[Latitude 39° 20′ 10.2″. Longitude 107° 30′ 37.0″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
North Mam	100 32 24.36	280 18 53.44	4.49312	19.341
Quartzite	203 44 14.13	23 51 35.61	4.61372	25.531
Sunlight	228 37 19.73	48 42 19.07	4.17722	9.345
Chair	327 16 30	147 25 06	4.56391	22.765

EAGLES NEST, SUMMIT-EAGLE COUNTIES, COLO. (Not occupied; probably on line between Summit and Eagle counties.)

Highest peak of Eagles Nest Mountain, which is composed of several sharp peaks. It is on the Park Range or Gores Mountains, which is the divide between Blue River on the east and Piney River on the west, and is just northwest of Mount Powell and about 20 miles south of the town of Kremmling on the Denver & Salt Lake (Moffat) Railroad).

Signal and station mark: Center of highest peak.

[Latitude 39° 46′ 33.5″. Longitude 106° 20′ 58.7″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Holy Cross	18 15 32	198 10 30	4.55756	22.43
Piney	110 41 02	290 35 23	4.12912	8.36
Lone Peak	148 19 18	328 16 08	4.12782	8.34
Kremmling	179 35 56	359 35 51	4.44804	17.43
Byers	253 55 57	74 11 23	4.55469	22.29
Ute	267 15 47	87 26 32	4.36925	14.54
Ptarmigan	288 39 09	108 51 34	4.46700	18.21

ELK, GRAND COUNTY, COLO.

On the highest point of Elk Mountain, well-known point about 6 miles (air line) north from Sulphur Springs and 12 or 13 miles north and east of Granby. There is a road and trail on east side of the mountain that horses can be ridden up, but there should be an easier route from the west side, as the slope is more gradual from that direction.

Signal: A cairn 6 feet high.

Station mark: A bronze tablet set in solid rock 5.5 feet from signal; true azimuth 348° 39′ 08″.

[Latitude 40° 09′ 43.630″. Longitude 106° 07′ 40.314″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Lone Peak	39 38 04.32	219 26 20.20	4.6105488	25.345
Kremmling	52 16 05.24	232 07 25.62	4.3835962	15.030
Flattop	78 57 46.93	258 20 53.73	4.9192948	51.599
Whiteley	119 16 06.32	299 01 58.01	4.5507498	22.085
Rabbit Ears	125 49 10.79	305 30 27.72	4.7031490	31.369
Buffalo	152 10 40	332 05 20	4.39787	15.54
Parkview	177 59 08.05	357 58 50.07	4.2716203	11.614
Arapahoe	290 05 35.00	110 24 03.49	4.6380472	27.002
Byers	334 50 53.68	154 57 53.03	4.5619737	22.663
Ptarmigan	350 29 45.75	170 33 41.57	4.7244747	32.948
Ute	353 59 42.14	174 01 40.81	4.6234818	26.112

FLATTOP, GARFIELD COUNTY, COLO.

In T. 1 N., R. 86 W., in the southwest corner of township, on the highest point (about the center) of Dome Peak, forming the extreme northeast end of White River Plateau, at the head of the White and Bear rivers and tributaries to Grand River. Plateau is locally known as the "Flattop." Sunnyside Creek heads on the east slope of the peak, the east prong of Derby Creek on the southwest slope, and Egeria Creek is on the northeast. It is about 15 miles west of Toponus, on the Moffat Railroad. Station can be easily reached from Burns post office, at the junction of Sunnyside Creek with Grand River, by following main road up creek through irrigated farms and across divide into Dry Gulch, thence by cow trails about 7 miles to station. Animals were ridden to within 100 yards of station. A nearer way would be to approach from the north by leaving the Yampa-Trappers Lake trail at a point near the 13-mile post from Yampa and follow up the slope of ridge that runs from station to the Bear River. From this side animals were ridden to a point under the peak about one-half mile northeast of station. A very large and well-built rock cairn was found which had a stick in top on which was carved what appeared to be land corner markings. Probably a point on or near the base line along the fortieth degree parallel.

Station mark: A bronze tablet in solid rock 13.6 feet from signal; true azimuth, 14° 14′ 34″.

Signal: A large rock cairn 12 feet at base and 18 feet high.

[Latitude 40° 00′ 54.006″. Longitude 107° 04′ 57.114″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Sopris	4 48 34.18	184 45 26.88	4.9240419	52.167
Quartzite	28 06 16.92	207 57 15.01	4.6313498	26.589
Turret	31 55 20	211 50 49	4.27855	11.80
Shingle	39 54 01	219 49 16	4.21549	10.21
North Mam	44 10 05.18	223 40 04.66	4.9859326	60.157
Limestone	48 17 16.92	228 04 10.94	4.59177	24.27
Plateau	80 23 40.09	260 14 22.67	4.3194980	12.967
Pagoda	123 08 26	302 58 46	4.40575	15.82
Pyramid	155 16 10	335 13 23	4.16592	9.10
Rabbit Ears	221 08 33.37	41 26 51.29	4.7847386	37.852
Whiteley	236 00 14.75	56 23 04.51	4.7815885	37.578
Gore	237 18 48	57 35 17	4.63453	26.78
Parkview	246 13 47.44	66 50 26.55	4.9441459	54.638
Elk	258 20 53.73	78 57 46.93	4.9192948	51.599
Lone Peak	285 00 29.14	105 25 32.78	4.7605316	35.800
Piney	293 19 34.36	113 42 07.55	4.7373526	33.939
Castle	321 09 01.27	141 18 45.04	4.5382436	21.458

GORE, ROUTT COUNTY, COLO. (Not occupied.)

A partly bald rocky peak of the Park Range, locally known as Gore Mountain, on divide between Bear River and Muddy Creek, at the head of Red Dirt Creek, which flows southeast into Muddy Creek. Station is in the NE. ¼ T. 3 N., R. 83 E., and about 12 miles southwest of Muddy Pass.

Signal and station mark: Highest point of rock forming top of peak.

[Latitude 40° 13′ 25.3″. Longitude 106° 39′ 22.6″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Flattop	57 35 17	237 18 48	4.63453	26.78
Rabbit Ears	189 48 38	9 50 26	4.36050	14.25
Whiteley	232 58 29	53 04 50	4.24118	10.83
Kremmling	309 45 40	129 57 26	4.52877	21.00

HAGUE, LARIMER COUNTY, COLO.

Station is on the highest of three points known as Fairchild, Hague, and Mummy. Hague is the central point and is northwest of Lawn Lake. To reach the station, take wagon road from Estes Peak to Horseshoe Flats, thence trail up Roaring River to Lawn Lake camp at this lake. Horses can be ridden to the pass between Fairchild and Hague.

Signal: A rock cairn 6 or 7 feet high.

Reference mark: A triangulation tablet set in solid rock 3.1 feet northwest of signal.

[Latitude 40° 29′ 04.636″. Longitude 105° 38′ 44.944″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Arapahoe	0 22 50.79	180 22 41.58	4.7062917	31.597
Parkview	67 45 52.53	247 26 49.59	4.6528901	27.941
Richthofen	85 33 20.16	265 23 39.75	4.3248338	13.128
Lulu	98 10 36.8	278 02 35.5	4.24619	10.95
Clark	119 35 38.32	299 24 34.80	4.4408578	17.148
Rawah	126 39 57.7	306 27 53.4	4.51372	20.28
Shipman	136 26 54.49	316 10 02.43	4.7228605	32.825
North Bald	172 07 25.19	352 05 20.85	4.5142423	20.305
South Bald	171 58 57.26	351 57 00.85	4.4782220	18.688
Twin	206 55 04.95	27 09 54.59	4.8468583	43.673
Livermore	224 34 51.09	44 48 40.84	4.6293164	26.465
Whitepine	231 39 36.9	51 47 24.9	4.33404	13.41
Horsetooth	260 44 19.95	81 01 51.42	4.5865260	23.981
Hogback	305 44 00.01	126 01 26.43	4.6726149	29.239
Sugarloaf	339 03 16.99	159 12 06.85	4.7355109	33.796
Longs Peak	354 01 35.74	174 02 48.81	4.4085248	15.917

HOGBACK, BOULDER COUNTY, COLO.

Highest point of Hogback Ridge about 3 miles northwest of Hygiene, Colo. Locally known as Rabbit Mountain.

Station mark: Tablet in bed rock.

Reference mark: An arrow with crossbar cut in the rock and pointing to the station. True azimuth from station 244° 42′; distance 2.22 feet.

Signal: A pine tree 74 feet northwest of tablet.

[Latitude 40° 14′ 10.524″ (U); 40° 14′ 10.67″ (T). Longitude 105° 11′ 49.091″ (U); 105° 11′ 49.02″ (T)].

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Sugarloaf (U)	39 06 17.39	218 57 44.40	4.4759726	18.592
Sugarloaf (T)	39 05 48	218 57 15	4.475977	18.592
Arapahoe	59 03 27.14	238 45 56.46	4.6538537	28.003
Longs Peak	93 31 04.75	273 14 53.68	4.5513024	22.113
Lillie	100 54 27.60	280 42 09.77	4.4388088	17.067
Twin	102 10 13.71	281 57 49.40	4.4444957	17.292
Hague	126 01 26.43	305 44 00.01	4.6726149	29.239

NOTE.—(U)=values obtained by Urquhart from the northwest; (T)=values obtained by Tweedy from the east.

HOLY CROSS, EAGLE COUNTY, COLO.

In T. 7 S., R. 81 W., near the northwest corner of the township (approximate). On the highest point of the Holy Cross Mountain, about 7 miles (air line) southwest of Red Cliff on the Rio Grande Railroad and 10 miles southwest of Minturn. Roche Moutonnee (or Cross) Creek flows along the north base of the mountain. Station was reached from the town of Minturn by road and trail to the halfway cabin on Cross Creek and thence on foot to the summit, a climb of about 4,000 feet. Station is the same as that used by the Hayden Survey and also cut in later by the Coast and Geodetic Survey.

Signal and station mark: A rock cairn about 7 feet high.

Reference mark: An aluminum tablet distant 26 feet; true azimuth 312° 51′.

[Latitude 39° 28′ 01.528″. Longitude 106° 28′ 51.911″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Sopris	69 01 09.20	248 35 09.70	4.8002642	39.230
Red Table	77 03 00	256 53 01	4.36438	14.38
Castle	138 40 19.66	318 26 59.35	4.6554340	28.105
Piney	178 02 00.11	358 01 24.15	4.5917769	24.273
Lone Peak	185 14 49.31	365 16 42.09	4.6618523	28.523
Eagles Nest	198 10 30	18 15 32	4.55756	22.43
Powell	200 21 20	20 26 44	4.54103	21.60
Byers	225 55 26.33	46 15 54.32	4.8037768	39.548
Ptarmigan	237 24 39.54	57 42 03.84	4.6660692	28.802

HORSETOOTH, LARIMER COUNTY, COLO.

This station of the United States Coast and Geodetic Survey is identical with the United States Geological Survey station of the same name. It is 8 miles southwest of Fort Collins on a high, bare rocky point of the divide immediately east of Redstone Creek and 1¼ miles north of the point where the Fort Collins-Estes Park road crosses the divide. Deep vertical clefts divide the peak into three nearly equal parts, which have the appearance of gigantic teeth when viewed from the eastward. The station is on the highest and most southern one of the three divisions of the peak and is marked by a United States Geological Survey triangulation tablet set in solid rock. A reference mark, Coast and Geodetic Survey standard disk, is 0.04 meter below the station and 4.74 meters distant in azimuth 171° 24′.

[Latitude 40° 32′ 22.856″ (K); 40° 32′ 23.00″ (C). Longitude 105° 11′ 46.319″ (K); 105° 11′ 46.21 (C).]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Hague	81 01 51.42	260 44 19.95	4.5865260	23.981
White Pine	109 00 45.0	288 51 00.5	4.34920	13.885
Livermore (K)	161 31 38.54	341 27 54.35	4.4061788	15.832
Livermore (C)	161 31 44.63	341 28 00.49	4.4061105	15.829
Twin	173 57 12.15	353 54 24.76	4.7543881	35.297

NOTE.—(K)=values obtained by Kendall from Coast and Geodetic Survey base, Twin-Horsetooth; (C)=values obtained by Chapman.

KREMMLING, GRAND COUNTY, COLO.

In T. 1 N., R. 80 W., near corner of secs. 21, 22, 27, and 28, on highest point of Junction Butte, a bald hill lying in the junction of the Grand and Blue rivers about 2 miles southeast of the town of Kremmling, on the Denver, Northwestern & Pacific Railroad.

Signal: Cairn 8 feet high.

Station mark: Bronze triangulation tablet in 6 by 8 by 24-inch stone over which is the cairn 8 feet high.

[Latitude 40° 01′ 42.928″. Longitude 106° 21′ 07.092″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Lone Peak	22 22 55.53	202 19 50.48	4.2548646	11.174
Piney	28 01 20.09	207 55 45.61	4.4213461	16.394
Castle	55 18 59.57	235 00 36.36	4.6970212	30.928
Gore	129 57 26	309 45 40	4.52877	20.99
Rabbit Ears	153 40 18.13	333 30 17.63	4.6938827	30.707
Whiteley	159 35 56.28	339 30 29.59	4.5352979	21.313
Buffalo	191 17 16	11 20 37	4.57584	23.40
Parkview	208 44 33.61	28 52 56.16	4.5825067	23.761
Elk	232 07 25.62	52 16 05.24	4.3835962	15.030
Byers	297 35 46.05	117 51 22.83	4.5924932	24.313
Ute	318 46 43.44	138 57 19.53	4.5539286	22.247
Powell	358 00 51	178 01 19	4.47404	18.50
Eagles Nest	359 35 51	179 35 56	4.44804	17.434

LEON, MESA-DELTA COUNTY LINE, COLO.

On summit of Leon Peak on the Delta-Mesa county line; a well-known peak at the head of Big Creek about 11 miles south and 6 miles east of Collbron. Station is in T. 11 S., R. 94 W., near east edge of sec. 24, and can be easily reached by wagon road from Collbrun up Big Creek via Big Creek ranger station to sawmill, thence by ranger's trail to summit. Animals can be ridden to foot of peak about 0.25 mile northeast of summit. Good feed and water.

Signal: Center of cupola of Forest Service lookout house.

Station mark: A standard bronze tablet set in large bowlder under center of cupola of Forest Service lookout house, 10 feet square. House built of wood and tin and painted white.

[Latitude 39° 04′ 46.912″ (K); 39° 04′ 46.864″ (U). Longitude 107° 50′ 36.725″ (K); 107° 50′ 37.173″ (U).]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
North Mam=(Mams) (K)	176 49 33.26	356 48 43.28	4.5334545	21.223
North Mam=(Mams) (U)	176 49 08.25	356 48 18.18	4.5332803	21.214
Quartzite	214 17 12.33	34 37 13.83	4.9037615	49.787
Sunlight	226 04 35.46	46 22 13.11	4.7443496	34.491
Sopris	250 49 10.64	71 14 55.62	4.7930130	38.580
Chair	272 36 53	92 58 08	4.68750	30.26

NOTE.—(K)=values obtained by Kendall from the east; (U)=values obtained by Urquhart from the west.

LILLIE, LARIMER COUNTY, COLO. (Not occupied.)

On Lillies Peak, also known as Sheep Mountain, 8 miles north of Estes Park, Colo.

Station mark: A monument on the southeast peak.

[Latitude 40° 16′ 57.470″. Longitude 105° 30′ 50.802″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Bald	7 25 38.93	187 24 10.80	4.3987818	15.564
Longs Peak	70 22 44.43	250 18 50.87	3.9574063	5.633
Hogback	280 42 09.77	100 54 27.60	4.4388088	17.067
Sugarloaf	343 53 16.81	163 56 59.81	4.4705158	18.360

LIMESTONE, GARFIELD COUNTY, COLO.

In T. 3 S., R. 89 W., in the west-central part of the township (approximate). A point on White River Plateau, which is the divide bweteen Grand and White rivers. Station is about 7 miles northwest of the old mining town of Carbonate and 18 miles southeast of Bufart, a post office on the White River. The old Ute trail from Deep Lake to Meeker crosses the divide about 1.25 miles south of the station, from which point a cow trail leads north along the ridge to station. Station is on the first summit north of the Ute trail and is about 2 miles south of the highest point of the ridge. Top of ridge is clear of both timber and brush.

Station mark: Bronze tablet in 6 by 6 inch sandstone set 15 inches in ground on solid rock distant 5.6 feet; true azimuth 21° 24′ from signal.

Signal: Rock cairn 8 feet high.

[Latitude 39° 46′ 49.5″. Longitude 107° 25′ 22.6″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
North Mam	41 09 59.90	220 53 04.77	4.76282	36.00
Rio Blanco	81 08 23.81	260 49 29.37	4.63110	26.574
Flattop	228 04 10.94	48 17 16.92	4.59177	24.273
Castle	270 48 03.61	91 10 49.95	4.70614	31.586
Quartzite	322 19 35.05	142 23 37.73	4.17049	9.201

LITTLE BALD, LARIMER COUNTY, COLO.

On the central of three small rises forming the summit of Little Bald Mountain, which is a spur of the Green Ridge and lies between the head waters of the North and South Forks of Lone Pine Creek. A wagon road leads from the Eaton Ditch camp on Sand Creek and passes about 1½ miles to west of the station and continues on to a junction with the "State Road" near the head of Deadman Creek.

Signal: A cairn 8 feet high with tree and flags in center.

Station mark: Bronze tablet in solid rock 1.5 feet northwest of signal.

[Latitude 40° 51′ 31.29″. Longitude 105° 45′ 23.46″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Clark	27 38 25.18	207 31 39.13	4.4987823	19.594
Shipman	83,03,53.90	262 51 18.62	4.4355270	16.939
Bull	135 14 52.38	315 11 50.18	3.9662174	5.749
Jelm	145 06 25.18	324 57 45.72	4.5094200	20.080
Gale	214 05 59.14	34 12 32.58	4.3980700	15.539
Dead Tree	223 06 46.30	43 11 42.20	4.1892380	9.607
Black	261 29 34.8	81 34 13.9	4.00428	6.28
North Bald	332 02 28.52	152 04 44.19	4.0162804	6.451

LIVERMORE, LARIMER COUNTY, COLO.

On the highest point of a rocky mountain, about 3 miles southwest of Livermore post office. It is between Lone Pine Creek and Main North Fork of Cache la Poudre River. It is about 4 miles north of Grey Rock, a bare peak with cliff on east, south, and west. Horses can be ridden to station. Easily reached via long ridge southwest from Livermore post office via Griffith's ranch.

Station mark: A bronze tablet cemented in solid rock.

Signal: Pole quadripod, with flags.

[Latitude 40° 45′ 26.156″ (K); 40° 45′ 26.18″ (C). Longitude 105° 17′ 30.479″ (K); 105° 17′ 30.29″ (C).]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
White Pine	37 37 56.0	217 31 54.7	4.32922	13.26
Hague	44 48 40.84	224 34 51.09	4.6293164	26.465
South Bald	89 18 01.66	269 02 12.92	4.5326838	21.185
North Bald	93 36 55.83	273 20 58.94	4.5369750	21.396
Gale (K)	141 56 32.72	321 44 50.36	4.6089706	25.253(K)
Gale (C)	141 56 35.40	321 44 53.11	4.6089354	25.252(C)
Cap Rock	150 58 13.12	330 51 55.97	4.4436084	17.257
Twin	183 38 08.85	3 39 06.44	4.5104191	20.127
Horsetooth (K)	341 27 54.35	161 31 38.54	4.4061788	15.832(K)
Horsetooth (C)	341 28 00.49	161 31 44.63	4.4061105	15.829(C)

NOTE.—(K)=values obtained by Kendall from Coast and Geodetic Survey base; (C)=values obtained by Chapman.

LONE PEAK, SUMMIT-EAGLE COUNTIES, COLO.

Station is on highest point of Lone Peak or Sheep Mountain on divide between Sheephorn Creek and Blue River. It is about 20 miles a little west of south of Kremmling, a town on Moffat (Denver & Salt Lake) Railroad. Animals can be taken to the summit by going up Sheephorn Creek, on road about 4.5 miles above Mr. C. L. Gutzler's ranch, which is 2 miles above Sheephorn post office; thence northeast up ridge to summit of mountain. It is a timber-covered mountain, with bald peak on summit. Animals may also be ridden up the long slope from Blue River side, but this route will be through timber all the way up.

Signal: A cairn 8 feet high on highest peak.

Station mark: A triangulation tablet set in rock about 4.4 feet southeast of signal. True azimuth 286° 31′.

[Latitude 39° 52′ 43.686″. Longitude 106° 25′ 55.254″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Holy Cross	5 16 42.09	185 14 49.31	4.6618523	28.523
Piney	39 43 57.57	219 41 28.26	3.9380361	5.388
Flattop	105 25 32.78	285 00 29.14	4.7605316	35.800
Whiteley	173 58 08.01	353 55 47.44	4.6905859	30.474
Kremmling	202 19 50.48	382 22 55.53	4.2548646	11.174
Elk	219 26 20.20	39 38 04.32	4.6105488	25.345
Byers	272 00 50.78	92 19 30.83	4.6185878	25.819
Ute	288 38 46.29	108 52 25.99	4.5070077	19.969
Ptarmigan	300 47 29.44	121 03 05.22	4.6081278	25.205
Eagles Nest	328 16 08	148 19 18	4.12782	8.340

LONGS PEAK, BOULDER COUNTY, COLO.

On the highest point on Longs Peak, near the corner of Boulder, Grand, and Larimer counties. It can be ascended from Longs Peak draw. Animals can be ridden within about 2 miles' distance and 2,000 feet in elevation.

Reference mark: A copper tablet set in large bowlder at the summit, 5 feet south of cairn.

Station mark: A rock cairn built on high bowlder. (Not on Continental Divide.)

Latitude 40° 15′ 18.613″; 40° 15′ 20.8″ (Hayden). Longitude 105° 36′ 52.140″; 105° 36′ 38.2″ (Hayden).

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Arapahoe	6 46 19.98	186 44 58.07	4.4073647	15.875
Parkview	100 50 10.91	280 29 57.71	4.6540764	28.017
Richthofen	135 09 15.54	314 58 23.44	4.5268160	20.901
Hague	174 02 48.81	354 01 35.74	4.4085248	15.917
Twin	245 50 43.10	65 54 30.24	3.9588714	5.652
Lillie	250 18 50.87	70 22 44.43	3.9574063	5.633
Hogback	273 14 53.68	93 31 04.75	4.5513024	22.113
Sugarloaf	326 29 22.32	146 36 58.20	4.4824674	18.872
Bald	346 15 49.34	166 18 14.26	4.3508207	13.937

LOOKOUT, GARFIELD COUNTY, COLO.

In T. 6 S., Rs. 88 and 89 W., near the corner of secs. 1, 6, 7, and 12 (approximate). On the highest point of Lookout Mountain, which lies between Grand River and Roaring Fork and is about 4 miles southeast of Thur junction, at Glenwood Springs, and is nearly south and opposite the mouth of Grizzly Canyon. The mountain has three peaks, the station being on the third from the west end. A good trail leads from Glenwood Springs to a pavilion (now burnt) on the west end of the mountain. From there a cow trail leads along the ridge to the station. Can also be reached by old wood road and trail from a ranch about 2 miles southeast of the station. Animals were ridden to the station. Feed good. No water.

Station mark: Bronze tab'et set in 6 by 8 by 30 inch stone 24 inches in ground.

Signal: Of five sides, constructed of dead poles, with a center pole set on tablet and carrying white and red flags.

[Latitude 39° 32′ 30.51″. Longitude 107° 16′ 10.71″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Sunlight	36 11 52.97	216 07 42.11	4.20353	9.93
North Mam	71 38 45.26	251 16 01.90	4.73308	33.607
Rio Blanco	109 50 26.23	289 25 42.48	4.77012	36.599
Castle	235 42 45.71	55 59 36.47	4.65917	28.348
Sopris	343 40 58.81	163 45 00.00	4.51088	20.148

LULU, JACKSON-LARIMER COUNTIES, COLO. (Not occupied.)

On Lulu Mountain, on line between Jackson and Larimer counties, about 3 miles northwest of La Poudre Pass, at the headwaters of the South Fork of Cache la Poudre River.

Signal and station mark: Rock cairn on highest point. Sighted from two points; position doubtful.

[Latitude 40° 30′ 25.3″. Longitude 105° 51′ 06.0″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Richthofen	40 57 54.9	220 56 15.5	3.74032	3.42
Hague	278 02 35.5	98 10 36.8	4.24619	10.95

NORTH BALD, LARIMER COUNTY, COLO.

On the most northern of the five peaks forming Bald Mountain, which is at the headwaters of Lone Pine and Seven-Mile creeks on the east and Roaring and Nun creeks on the west. The peak is timbered on all sides but has a small rocky summit which is bare. Station is on west end of bare space. A good wagon road and ranger's trail lead from Manhattan on the Livermore-Log Cabin-Home road passing a point about 1½ miles south of the peak. A ranger's trail also leads direct from the Lone Pine ranger station which is on the State road about 4 miles northeast of the station. This trail joins the road from Manhattan in the gap between North and South Bald.

Signal: A rock cairn 7 feet high with pine tree and flagpole in center.

Station mark: Bronze tablet in solid rock under center of cairn.

POLITECHNIKA GDAŃSKA ZAKŁAD GEOLOGII

[Latitude 40° 46′ 33.964″. Longitude 105° 41′ 55.894″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Richthofen	25 57 54.36	205 50 16.55	4.5778913	23.509
Clark	46 07 54.99	225 58 53.99	4.4323100	16.814
Rawah	59 10 21.0	239 00 19.7	4.40169	15.67
Shipman	100 28 11.10	280 13 20.83	4.5114089	20.172
Jelm	146 49 44.44	326 38 49.41	4.6298236	26.496
Little Bald	152 04 44.19	332 02 28.52	4.0162804	6.451
Dead Tree	195 36 17.49	15 38 57.35	4.3270751	13.195
Gale	197 04 07.62	17 08 24.80	4.4948318	19.417
Black	205 36 54.2	25 39 16.6	4.07197	7.34
Cap Rock	223 06 13.75	43 15 55.54	4.4831240	18.901
Twin	230 06 34.16	50 23 31.46	4.6746935	29.379
Livermore	273 20 58.94	93 36 55.83	4.5369750	21.396
White Pine	311 31 47.3	131 41 41.3	4.45656	17.779
South Bald	353 42 55.49	173 43 03.43	3.4152968	1.617
Hague	352 05 20.85	172 07 25.19	4.5142423	20.305

NORTH MAM, GARFIELD COUNTY, COLO.

On summit of the North Mam Peak, the highest point of the Battlement Mesa, about 10 miles south and 5 miles west of Rifle, from which point it can be easily reached by wagon road up Beaver Creek to Fondett's ranch and thence by trail till peak first shows on the right. The best way from this point is to turn nearly north and approach the peak from the northeast side. Animals can be ridden to foot of peak on northeast side about 0.25 mile from summit.

Signal: A cairn 6 feet high with 10-foot pine pole in center.

Station mark: A bronze tablet set in stone and placed in crevice of rock over which which was built a cairn 6 feet high.

[Latitude 39° 23′ 12.25 ″ (C. & G. S.); 39° 23′ 12.758″ (K); 39° 23′ 11.71″ (U-N); 39° 23′ 12.259″ (U-W). Longitude 107° 51′ 56.34″ (C. & G. S.); 107° 51′ 55.749″ (K); 107° 51′ 55.98″ (U-N); 107° 51′ 56.336″ (U-W).]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Rio Blanco (K)	173 20 39.76	353 18 44.36	4.5710099	23.140
Rio Blanco (U-N)	173 20 40.76	353 18 45.36	4.5710313	23.141
Sleepy Cat (K)	199 06 49.57	19 19 46.95	4.9438947	54.607
Sleepy Cat (U-N)	199 06 35.44	19 19 32.69	4.9439031	54.608
Plateau	214 54 05.42	35 14 51.55	4.9080739	50.283
Limestone	220 53 04.77	41 09 59.90	4.76282	36.00
Flattop	223 40 04.66	44 10 05.18	4.9859326	60.157
Quartzite	235 40 13.44	56 01 09.15	4.7553972	35.379
Lookout	251 16 01.90	71 38 45.26	4.73308	33.607
Sunlight	263 58 55.09	84 17 26.37	4.6243113	26.161
Divide	280 18 53.44	100 32 24.36	4.49312	19.341
Sopris	282 44 27.82	103 11 07.96	4.7928455	38.565
Chair	305 41 48	125 03 57	4.79404	38.671
Leon (K)	356 48 43.28	176 49 33.26	4.5334545	21.223
Leon (U-W)	356 48 18.18	176 49 08.25	4.5332803	21.214

NOTE.—(C. & G. S.)= values of Coast and Geodetic Survey cut in from 2 points; (K)= value of Kendall from east; (U-N)= Urquhart from north; (U-W)= Urquhart from west.

PAGODA, RIO BLANCO COUNTY, COLO. (Not occupied.)

Station is the highest point of Pagoda Peak, a high sharp peak about 11 miles east of Sleepy Cat Mountain.

[Latitude 40° 08′ 24.3″ (K); 40° 08′ 23.49″ (U). Longitude 107° 19′ 57.5″ (K); 107° 19′ 57.92 ″ (U).]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Sleepy Cat (K)	87 50 04	267 42 31	4.22138	10.34
Sleepy Cat (U)	87 49 50.12	267 42 17.06	4.2214469	10.347
Flattop	302 58 46	123 08 26	4.40575	15.82
Plateau	357 24 46	177 25 07	4.24095	10.82

NOTE.—(K)= values obtained by Kendall from the south; (U)= values obtained by Urquhart from the north.

PARKVIEW, GRAND-JACKSON COUNTIES, COLO.

On the highest point of Parkview Mountain, on Continental Divide, and on line between Jackson and Grand counties. It is at the source of Willow Creek and East Troublesome Creek flowing south and Willow Creek flowing north. There is a road from Granby to North Park which crosses the divide 4 or 5 miles east of signal. Leave this road at Forestry station and go up trail along telephone line to summit of mountain. Animals can be ridden all the way up.

Signal and station mark: A rock cabin 9 by 8 by 7 feet high, erected by the Forestry Service.

Reference mark: A United States Geological Survey triangulation tablet set in southeast corner of rock cabin.

[Latitude 40° 19′ 49.228″. Longitude 106° 08′ 08.145″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Kremmling	28 52 56.16	208 44 33.61	4.5825067	23.761
Castle	43 56 33.10	223 29 45.17	4.9329814	53.252
Flattop	66 50 26.55	246 13 47.44	4.9441459	54.638
Rabbit Ears	105 05 33.43	284 47 06.45	4.6203235	25.922
Buffalo	107 18 15	287 13 13	4.06171	7.162
Richthofen	232 53 07.62	53 02 30.90	4.4095087	15.954
Hague	247 26 49.59	67 45 52.53	4.6528901	27.941
Longs Peak	280 29 57.71	100 50 10.91	4.6540764	28.017
Arapahoe	309 01 04.89	129 19 53.27	4.7273518	33.167
Byers	342 38 11.23	162 45 29.24	4.7336831	33.654
Elk	357 58 50.07	177 59 08.05	4.2716203	11.614

PINEY, EAGLE COUNTY, COLO.

Station is on the southern of two peaks on ridge between Sheephorn and Piney creeks. A forest-reserve trail from Mr. Ross's ranch on Sheephorn Creek about 5 miles above Sheephorn post office crosses the ridge about 1 mile north of signal. Animals can be ridden to summit of mountain.

Signal: Rock cairn 7 feet high.

Station mark: A United States Geological Survey triangulation tablet set in solid rock 3.3 feet southeast of signal; true azimuth 309° 47′.

[Latitude 39° 49′ 07.425″. Longitude 106° 29′ 48.277″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Red Table	25 36 54	205 27 26	4.69063	30.48
Castle	79 54 10.57	259 41 23.38	4.4620398	18.005
Flattop	113 42 07.55	293 19 34.36	4.7373526	33.939
Rabbit Ears	171 53 13.48	351 48 50.17	4.8341032	42.409
Whiteley	180 21 38.05	00 21 47.57	4.7438366	34.450
Kremmling	207 55 45.61	28 01 20.09	4.4213461	16.394
Lone Peak	219 41 28.26	39 43 57.57	3.9380361	5.388
Byers	263 38 43.17	83 59 51.80	4.6753682	29.425
Eagles Nest	290 35 23	110 41 02	4.12912	8.36
Powell	295 38 49	115 44 50	4.17340	9.26
Holy Cross	358 01 24.15	178 02 00.11	4.5917769	24.273

PLATEAU (OLD MARVINE), RIO BLANCO-GARFIELD COUNTIES, COLO.

In T. 1 S., R. 88 W., sec. 30 (approximate). On the highest and most northern of two peaks at the head of Marvine Creek to northwest and Doe Creek to the south. It is about 5 miles northeast of Marvine Lake and 6 miles west of Trappers Lake, both well-known fishing resorts. The peak is known as Plateau Peak and is about 3 miles north of Mount Marvine. Both peaks rise abruptly from the plateau forming the divide between the north and south forks of the White River and tributary of the

Grand River, which plateau can be reached by trails from Marvine Lake or Hanes ranch on the North Fork of White River. Wagon roads lead to Meeker from both places. It can also be reached by trails leading off from the Glenwood Springs-Trappers Lake trail. Station is near the Garfield-Rio Blanco county line. This is the same point cut in by Charles F. Urquhart under the name of Marvine.

Station mark: Bronze tablet in stone over which was erected a rock cairn 8 feet high. Old cairn was torn down and tablet set under center.

Signal: Rock cairn 8 feet high.

[Latitude 39° 59′ 00.202″ (K); 39° 58′ 59.45″ (U). Longitude 107° 19′ 24.327″ (K); 107° 19′ 24.92″ (U).]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
North Mam	35 14 51.55	214 54 05.42	4.9080739	50.283
Sleepy Cat (K)	133 54 37.55	313 46 43.97	4.3834892	15.026
Sleepy Cat (U)	133 54 23.19	313 46 29.63	4.3834442	15.024
Pagoda	177 25 07	357 24 46	4.24095	10.82
Pyramid	220 33 08	40 39 39	4.34538	13.76
Flattop	260 14 22.67	80 23 40.09	4.3194980	12.967
Shingle	312 05 23	132 09 55	4.13237	8.43
Turret	319 58 13	140 02 59	4.21728	10.25
Quartzite	359 08 46.37	179 09 00.09	4.5348564	21.292

NOTE.—(K)=values obtained by Kendall from the south; (U)=values obtained by Urquhart from the north.

POWELL MOUNTAIN, EAGLE-SUMMIT COUNTIES, COLO. (Not occupied.)

Highest point of Mount Powell, a well-known peak of the Park Range (or Gores Mountains) on divide between Blue River on the east and Piney River on the west. It is about 20 miles south of the town of Kremmling on the Denver & Salt Lake (Moffat) Railroad. Station is probably on line between Eagle and Summit counties and is in T. 3 S., R. 80 W., in south part of the township. It is a station of the Hayden Survey.

Station mark and signal: Highest part of mountain.

[Latitude 39° 45′ 37.7″. Longitude 106° 20′ 23.8″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Holy Cross	20 26 44	200 21 20	4.54103	21.60
Piney	115 44 50	295 38 49	4.17340	9.26
Kremmling	178 01 19	358 00 51	4.47404	18.50
Byers	250 55 02	71 10 08	4.55147	22.12
Ute	262 50 22	83 00 47	4.35672	14.13

PTARMIGAN, GRAND-SUMMIT COUNTIES, COLO.

Station is on the highest point of Ptarmigan Peak, a bald mountain at the source of West Fork of Williams River and on the divide between Blue River and Williams River. It is about 7 miles a little east of north of Dillon. It was ascended from Mrs. Sundragger's ranch on Blue River 5 miles below Dillon, but I think animals can be ridden to it by going up any ridge from Blue River.

Signal: A rock cairn 8 feet high.

Station mark: A ¾-inch hole drilled in rock about 4 inches deep, 2.7 feet southwest of signal; true azimuth 18° 46′.

[Latitude 39° 41′ 27.844″. Longitude 106° 01′ 32.882″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log, meters.*	*Miles.*
Holy Cross	57 42 03.84	237 24 39.54	4.6660692	28.802
Eagles Nest	108 51 34	288 39 09	4.46700	18.21
Lone Peak	121 03 05.22	300 47 29.44	4.6081278	25.205
Ute	157 31 44.82	337 29 48.03	4.0558764	7.067
Elk	170 33 41.57	350 29 45.75	4.7244747	32.948
Byers	199 21 01.52	19 24 03.73	4.3102188	12.693
Arapahoe	220 41 26.94	40 55 54.52	4.6922537	30.592

PYRAMID, RIO BLANCO COUNTY, COLO. (Not occupied.)

Highest point of Pyramid Peak, a well-known peak at the north end of the White River Plateau and about 15 miles nearly west of Yampa.

Signal and station mark: Highest point of peak.

Sighted from two stations, position doubtful.

[Latitude 40° 08′ 05.4″. Longitude 107° 09′ 16.0″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Plateau	40 39 39	220 33 08	4.34538	13.76
Flattop	335 13 23	155 16 10	4.16592	9.10

QUARTZITE, GARFIELD COUNTY, COLO.

In T. 4 S., R. 88 W., near the west quarter corner of section 30 (approximate). On the highest point of Quartzite Ridge a well-known ridge which forms the divide between Grizzly Canon and Canon Creek. Station is on the highest point of a bare portion of the ridge at the head of No Name Creek and overlooks the brooks of that creek to the south and Grizzly Canon to the north and east. It is about 12 miles north of Glenwood Springs and 2 miles north of the Bennett or peaked-roof sawmill. The old road from Glenwood Springs via Bennetts Mill and the old town of Carbonate to Deep Lake crosses the ridge about 1 mile northwest of the station, from which point it can be easily reached with animals. A thick clump of pine trees on the hill was cut, leaving a lone tree for signal. The tree is near the line of the 11th Guide Meridian west and bears land markings which could not be deciphered.

Station mark: Bronze tablet in 6 by 8 by 30 inch sandstone set 24 inches in the ground, 6.3 feet, true azimuth 280° 48′ from signal.

Signal: Lone pine tree with flag in top.

[Latitude 39° 40′ 29.305″. Longitude 107° 19′ 02.903.″]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Sunlight	10 52 45.61	190 50 24.07	4.4497888	17.504
Divide	23 51 35.61	203 44 14.13	4.61372	25.531
Leon	34 37 13.83	214 17 12.33	4.9037615	49.787
North Mam	56 01 09.15	235 40 13.44	4.7553972	35.379
Limestone	142 23 37.73	322 19 35.05	4.17049	9.201
Plateau	179 09 00.09	359 08 46.37	4.5348564	21.292
Turret	205 05 30	25 10 03	4.37769	14.827
Flattop	207 57 15.01	28 06 16.92	4.6313498	26.589
Castle	255 18 17.73	75 36 59.95	4.6355323	26.846
Red Table	299 36 49	119 58 46	4.75521	35.364
Sopris	343 54 13.74	164 00 04.75	4.6789794	29.671

RABBIT EARS, JACKSON COUNTY, COLO.

In T. 6 N., R. 82 W., near the corner of secs. 28, 29, 32, and 33 (approximate). A point on the Park Range about 2 miles east of the Continental Divide and about 5 miles north of the west corner of Grand and Jackson counties. Station is on the western and higher of two large rock columns locally known as "Rabbit Ears." The peak is just east of the Continental Divide between the headwaters of Big Grizzly Creek on the south and Colorado Creek on the north. The Kremmling-Steamboat Springs road crosses the divide at a point about 2.5 miles southwest of the station, from which point it can be easily approached. The rock is precipitous on all sides and the top has to be gained from the south side by ladders.

Station mark: Bronze tablet set in solid rock over which was erected a rock cairn about 5 feet high and around this is a pole quadripod with flags at top and brush nailed to quadripod.

Signal: Rock cairn and quadripod with flags and brush.

Latitude 40° 25′ 37.896″. Longitude 106° 36′ 36.868″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Gore	9 50 26	189 48 38	4.36050	14.25
Castle	14 30 25.30	194 21 56.40	4.8754314	46.643
Flattop	41 26 51.29	221 08 33.37	4.7847386	37.852
Buffalo	283 56 28	104 09 53	4.48005	18.77
Parkview	284 47 06.45	105 05 33.43	4.6203235	25.922
Elk	305 30 27.72	125 49 10.79	4.7031490	31.369
Whiteley	320 28 15.12	140 32 49.36	4.1960495	9.759
Kremmling	333 30 17.63	153 40 18.13	4.6938827	30.707
Piney	351 48 50.17	171 53 13.48	4.8341032	42.409

RAWAH, LARIMER-JACKSON COUNTIES, COLO. (Not occupied.)

Round bare peak on the Medicine Bow Range at the head of Rawah Creek on the northeast and a prong of the East Fork of Platte River on the west.

Station mark and signal: What appears to be a low rock cairn on highest part of peak.

[Latitude 40° 39′ 34.0″. Longitude 105° 57′ 17.7″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Shipman	151 12 48.4	331 08 00.8	4.33125	13.32
North Bald	239 00 19.7	59 10 21.0	4.40169	15.67
Hague	306 27 53.4	126 39 57.7	4.51372	20.28
Richthofen	346 11 06.5	166 13 29.8	4.33722	13.51

RED, LARIMER COUNTY, COLO. (Not occupied.)

On the southwest or highest part of Red Mountain about 4 miles southeast of the Boswell ranch on the Laramie River and 3 miles south of the Lindsay ranch on the Tie Siding-North Park public road. Station is near the Colorado-Wyoming State line.

Signal and station mark: A clump of 4 pine trees, with flagpole in center. The end of mountain was cleared leaving only the signal trees standing.

[Latitude 40° 59′ 41.08″. Longitude 105° 56′ 03.74″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Shipman	33 10 50.13	213 05 13.13	4.3430520	13.690
Jelm	162 41 40.76	342 40 01.03	4.0760940	7.404
Gale	258 58 40.34	79 12 14.59	4.4701158	18.343
Dead Tree	278 25 54.15	98 37 50.30	4.4119216	16.042
Bull	315 13 43.27	135 17 40.50	4.0800898	7.472

RED TABLE (MOUNT THOMAS), EAGLE COUNTY, COLO. (Not occupied.)

On Red Table Mountain in T. 7 S., R. 83 W., near the southwest corner of township, near the head of Freeman Creek on the south, and a prong of Brush Creek on the north. On round bare knob.

Signal and station mark: Rock cairn.

[Latitude 39° 25′ 12.3″. Longitude 106° 44′ 34.6″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Sopris	64 15 56	243 59 55	4.60588	25.07
Quartzite	119 58 46	299 36 49	4.75521	35.36
Castle	169 14 38	349 11 19	4.60021	24.75
Piney	205 27 26	25 36 54	4.69063	30.48
Holy Cross	256 53 01	77 03 00	4.36438	14.38

RICHTHOFEN, LARIMER-JACKSON-GRAND COUNTIES, COLO.

On the summit of Mount Richthofen at the headwaters of Grand, Cache, La Poudre, and Michigan rivers. Station is on the southwest end of the summit and can be best reached by going up Saw Mill Creek from the Grand River Ditch camp, which can be reached from Poudre Pass by following up ditch or from Cameron Pass by ditch to old road, thence along the road via Lula Pass. Animals were ridden to a point just under the peak on the east side.

Signal: Rock cairn 7 feet high.

Station mark: Bronze tablet in stone set 2 feet in loose rock under the center of the cairn.

[Latitude 40° 28′ 10.597″. Longitude 105° 53′ 39.052″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Parkview	53 02 30.90	232 53 07.62	4.4095087	15.954
Walden Standpipe	131 46 51	311 31 53	4.63765	26.97
Shipman	158 49 33.89	338 42 24.43	4.6311193	26.575
Rawah	166 13 29.75	346 11 06.46	4.33722	13.51
Clark	168 57 43.19	348 56 20.91	4.1915898	9.659
North Bald	205 50 16.55	25 57 54.36	4.5778913	23.509
South Bald	208 04 09.12	28 11 54.72	4.5521945	22.159
Lulu	220 56 15.51	40 57 54.88	3.74032	3.42
Hague	265 23 39.75	85 33 20.16	4.3248337	13.128
Longs Peak	314 58 23.44	135 09 15.54	4.5268160	20.901
Arapahoe	337 00 03.85	157 09 32.33	4.7275240	33.180

RIO BLANCO, GARFIELD COUNTY, COLO.

Station is on the highest point of peak about 3.5 miles southeast of Rio Blanco stage station and post office. The post office is on Meeker and Rifle road, 24 miles from Meeker and 20 miles from Rifle. Animals can be ridden to summit of peak. Signal is a rock cairn 7 feet high. Station mark a United States Geological Survey triangulation tablet under center of cairn.

[Latitude 39° 43′ 12.104″ (K); 39° 43′ 11.12″ (U). Longitude 107° 54′ 56.965″ (K); 107° 54′ 57.19″ (U)].

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Limestone	260 49 29.37	81 08 23.81	4.63110	26.574
Lookout	289 25 42.48	109 50 26.23	4.77012	36.599
Sunlight	305 09 43.43	125 30 14.09	4.7521907	35.119
Sopris	307 58 18.52	128 26 59.59	4.9154230	51.141
North Mam (K)	353 18 44.36	173 20 39.76	4.5710099	23.140
North Mam (U)	353 18 45.36	173 20 40.76	4.5710313	23.141

NOTE.—(K)=values obtained by Kendall from the east; (U)=values obtained by Urquhart from the north.

SHINGLE, GARFIELD COUNTY, COLO. (Not occupied.)

On Shingle Peak on the east edge of White River Plateau about 10 miles southeast of Marvins Lake and about 7 miles south of Trappers Lake.

Signal and station mark: Rock cairn on highest point of peak.

[Latitude 39° 54′ 05.2″ Longitude 107° 12′ 20.6″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Plateau	132 09 55	312 05 23	4.13237	8.43
Flattop	219 49 16	39 54 01	4.21549	10.21
Castle	293 51 58	114 06 05	4.54688	21.89

SHIPMAN, LARIMER-JACKSON COUNTIES, COLO.

On the Medicine Bow Range about 1.5 miles northwest of the Ute Pass where the State road to Walden crosses the Medicine Bow Range 15 miles east of Walden. Station is on the first high point northwest of the Ute Pass and is probably on the line between Larimer and Jackson counties. It can be easily reached by following ranger's trail from Ute Pass to Village Belle mine. Wycola Trail leaves the State road at firebox 46 in the pass and runs within a few feet of the station.

Signal: A six-sided pole signal carrying white and black flags with white on sides and pine bushes at apex.

Station mark: Standard bench mark tablet set in solid rock, centered under signal.

[Latitude 40° 49′ 42.976″. Longitude 106° 04′ 38.312″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Walden Standpipe	56 58 21	236 50 31	4.30454	12.53
Jelm	195 50 32.61	15 54 30.39	4.4914620	19.267
Red	213 05 13.13	33 10 50.13	4.3430520	13.690
Bull	244 09 04.88	64 18 38.45	4.3577621	14.162
Little Bald	262 51 18.62	83 03 53.90	4.4355270	16.939
North Bald	280 13 20.83	100 28 11.10	4.5114089	20.172
South Bald	284 30 44.73	104 45 42.73	4.5225470	20.697
Hague	316 10 02.43	136 26 54.49	4.7228605	32.825
Rawah	331 08 00.8	151 12 48.4	4.33125	13.33
Clark	333 01 12.02	153 06 59.48	4.4409279	17.151
Richthofen	338 42 24.43	158 49 33.89	4.6311193	26.575

SLEEPY CAT, RIO BLANCO COUNTY, COLO.

Station is on a rocky peak about 0.5 or 0.8 mile northeast of Sleepy Cat Peak, a well-known mountain about 25 miles north-northeast of Meeker. The latter mountain is higher and more prominent than station, but can not be used on account of dense growth of timber at summit. There is a road from Meeker and from Thornburg to the Riley-Merritt sawmill at foot of peak. The mill is not being operated at present, but there is a United States forestry station there.

Signal: A rock cairn 6 feet high with spruce tree in center.

Station mark: A triangulation tablet set in center of cairn. Animals can be taken very near the point.

[Latitude 40° 08′ 03.35″ (K); 40° 08′ 02.46″ (U). Longitude 107° 31′ 40.24″ (K); 107° 31′ 40.75″ (U).]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Mams Peak (U)	19 19 32.69	199 06 35.44	4.9439031	54.608
Petrolite (U)	57 24 17.44	237 05 49.11	4.6866763	30.201
Cathedral (U)	63 01 09.57	242 21 48.79	4.9924938	61.072
Colorow (U)	95 43 03.65	275 17 53.95	4.7455392	34.585
Devils Hole (U)	99 50 48.40	279 36 25.30	4.5069846	19.968
Juniper (U)	129 32 58.47	309 13 32.53	4.7411607	34.238
North Mam (K)	19 19 46.95	199 06 49.57	4.9438947	54.607
North Mam (U)	19 19 32.69	199 06 35.44	4.9439031	54.608
Pagoda (K)	267 42 31	87 50 04	4.22138	10.34
Pagoda (U)	267 42 17.06	87 49 50.12	4.2214469	10.347
Plateau (K)	313 46 43.97	133 54 37.55	4.3834892	15.026
Plateau (U)	313 46 29.63	133 54 23.19	4.3834442	15.024

NOTE.—(K)=values obtained by Kendall from the south; (U)=values obtained by Urquhart from the north.

SOPRIS, PITKIN COUNTY, COLO.

In T. 9 S., R. 88 W., near the corner of secs. 23, 24, 25, and 26 (approximate). On the highest point of the southeastern peak of Sopris Mountain, a well-known mountain about 15 miles south of Carbondale on the Denver & Rio Grande and Colorado Midland railroads, from which place it can be easily reached by road up Antler (or Province) Creek to a sawmill near its head. A good trail leads from the sawmill to the top of the divide 1 mile south of the station.

Station mark: Bronze tablet in 8 by 8 by 24 inch stone set in loose rock, distant 6.2 feet; true azimuth 65° 18′ from cairn.

Signal: A large rock cairn 8 feet high replacing the one used by the Hayden Survey and E. M. Douglas in former work.

[Latitude 39° 15′ 41.280″ (K); 39° 15′ 36.2″ (D). Longitude 107° 09′ 50.705″ (K); 107° 09′ 57.4″ (D).]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Chair (K)	24 15 54	204 11 27	4.39324	15.37
Chair (D)	24 15 54	204 11 27.5	4.393718	15.384
Leon	71 14 55.62	250 49 10.64	4.7930130	38.580
North Mam	103 11 07.96	282 44 27.82	4.7928455	38.565
Rio Blanco	128 26 59.59	307 58 18.52	4.9154230	51.141
Sunlight	134 33 58.77	314 25 47.71	4.4150042	16.157
Lookout	163 45 00.00	343 40 58.81	4.51088	20.148
Quartzite	164 00 04.75	343 54 13.74	4.6789794	29.671
Flattop	184 45 26.88	4 48 34.18	4.9240419	52.167
Castle	206 46 14.44	26 59 00.42	4.8035053	39.524
Red Table	243 59 55	64 15 56	4.60588	25.074
Holy Cross	248 35 09.70	69 01 09.20	4.8002642	39.230

NOTE.—(K)=value obtained by Kendall from the north; (D)=value obtained by Douglas from the south. (See Bull. 122, p. 289.)

SOUTH BALD, LARIMER COUNTY, COLO.

On the central and highest of five peaks forming Bald Mountain, which is at the headwaters of Lone Pine and Seven-Mile creeks on the east and Roaring and Nun creeks on the west. Peak is bare on all sides and station is on the summit, which runs up very sharp. A good wagon road and rangers' trail leads from Manhattan on the Livermore-Log Cabin and Home road to a point just north of the peak. A ranger's trail also leads direct from the Lone Pine ranger station on the State road, which is about 5 miles northeast of the station.

Signal: A rock cairn 6 feet high with small flagpole in the center.

Station mark: A bronze tablet in stone set 2 feet in the ground 5.4 feet southeast of the signal; true azimuth 324° 58′.

[Latitude 40° 45′ 10.12″. Longitude 105° 41′ 43.76″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Richthofen	28 11 54.72	208 04 09.12	4.5521945	22.159
Shipman	104 45 42.73	284 30 44.73	4.5225470	20.697
North Bald	173 43 03.43	353 42 55.49	3.4152968	1.617
Gale	195 18 54.70	15 23 03.88	4.5270298	20.911
Livermore	269 02 12.92	89 18 01.66	4.5326838	21.185
Hague	351 57 00.85	171 58 57.26	4.4782220	18.688

SUGAR LOAF, BOULDER COUNTY, COLO.

High conical timbered mountain (bare rock on summit) known as Sugar Loaf Mountain, on south side of Four Mile Creek between Wall Street and Copper Rock. Reached by old railroad grade (now wagon road) from Sunset.

Station mark: Aluminum tablet under rock cairn.

[Latitude 40° 01′ 36.974″ (U) final; 40° 01′ 36.99″ (T). Longitude 105° 25′ 04.992″ (U); 105° 25′ 04.78″ (T).]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Arapahoe	89 59 27.02	269 50 30.50	4.2962388	12.291
Bald	107 17 48.57	287 12 38.19	4.0782957	7.441
Longs Peak	146 36 58.20	326 29 22.32	4.4824674	18.872
Hague	159 12 06.85	339 03 16.99	4.7355109	33.796
Twin	163 52 24.33	343 48 34.90	4.4807944	18.799
Lillie	163 56 59.81	343 53 16.81	4.4705158	18.360
Hogback (U)	218 57 44.40	39 06 17.39	4.4759726	18.592
Hogback (T)	218 57 15	39 05 48	4.475977	18.592

NOTE.—(U)=values obtained by Urquhart from the northwest; (T)=values obtained by Tweedy from the east.

SUNLIGHT, GARFIELD COUNTY, COLO.

In T. 7 S., R. 89 W., in the southwest corner of the township (approximate). Station is on the highest point of ridge forming the divide between waters of Roaring Fork River and West Divide Creek. Four Mile Creek, a tributary of Roaring Fork, flows along the south base of the ridge, and Three Mile and Garfield creeks head against the ridge and flow north and northwest, respectively. Station can be easily reached from Glenwood Springs by wagon road up Roaring Fork and Four Mile Creek via the Sunlight Mines to Likes ranch and sawmill, thence by trail north up Likes Branch to the divide, thence along or near the top of the ridge east to station. It is about 3 miles by trail north of Likes ranch. Timber was cut in order to afford a good view in all directions. A lone pine tree was left on the highest point for signal.

Station mark: Bronze tablet set in sandstone bowlder distant 6 feet; true azimuth 233° 57′ from signal.

Signal: Lone pine tree about 15 feet northwest of highest point with flag in top and braced by four poles carrying white targets.

[Latitude 39° 25′ 32.235″. Longitude 107° 22′ 45.192″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Leon	46 22 13.11	226 04 35.46	4.7443596	34.491
Divide	48 42 19.07	228 37 19.73	4.17722	9.345
North Mam	84 17 26.37	263 58 55.09	4.6243113	26.161
Rio Blanco	125 30 14.09	305 09 43.43	4.7521907	35.119
Quartzite	190 50 24.07	10 52 45.61	4.4497888	17.504
Lookout	216 07 42.11	36 11 52.97	4.20353	9.93
Sopris	314 25 47.71	134 33 58.77	4.4150042	16.157
Chair	348 16 43	168 20 26	4.61954	25.88

TURRET, GARFIELD COUNTY, COLO. (Not occupied.)

A small turret-shaped peak on the White River Plateau near the head of the South Fork of White River and about 12 miles southeast of Marvine Lake.

Signal and station mark: Center of peak.

[Latitude 39° 52′ 10.5″. Longitude 107° 11′ 58.2″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Quartzite	25 10 03	205 05 30	4.37769	14.83
Plateau	140 02 59	319 58 13	4.21728	10.25
Flattop	211 50 49	31 55 20	4.27855	11.80

TWIN, LARIMER COUNTY, COLO.

This station is on the northwestern of two prominent peaks locally known as the Twin Sisters but called Lilly Mountain in United States Geological Survey notes. There is a small mountain about 3 miles north-northwest of this point and half a mile north of Lilly Lake, locally known as Lilly Mountain. There is still another mountain about 5 miles northwest of the Twin Sisters, locally known as Sharp Mountain, consequently it would be confusing to call the station by any other name than Twin Sisters. The station is less than 3 miles in air line from Longs Peak. There is a trail from Longs Peak to the summit but horses can not be ridden more than two-thirds of the way.

Signal and station mark: A rock cairn 6.5 feet high.

Reference mark: A United States Geological Survey triangulation tablet set in solid rock 3 feet northeast of cairn.

[Latitude 40° 17′ 19.147″. Longitude 105° 31′ 00.758″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Bald	6 42 45.28	186 41 23.57	4.4096472	15.959
Longs Peak	65 54 30.24	245 50 43.10	3.9588714	5.652
Hogback	281 57 49.40	102 10 13.71	4.4444957	17.292
Sugarloaf	343 48 34.90	163 52 24.33	4.4807944	18.799

UTE, GRAND-SUMMIT COUNTIES, COLO.

Station is on the higher and southeastern of two small peaks on summit of a ridge lying between Blue River and Williams River and locally known as the Blue Ridge. It is about 3 miles south of the Big Ute pass, through which there is a very fair trail from Blue River to Williams River. Animals can be ridden along summit from pass to station, though there is no well-defined trail. The above-mentioned trail crosses Blue River at Mr. Andrew Linstrom's ranch, about 16 miles northwest of Dillon, and crosses Williams River at the Marble Bros. ranch.

Signal: A rock cairn about 6 feet high.

Station mark: A United States Geological Survey triangulation tablet set in rock, distant 3.5 feet southeast of signal; true azimuth 326° 46′ 41″.

[Latitude 39° 47′ 08.568″. Longitude 106° 04′ 35.563.″]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Powell	83 00 47	262 50 22	4.35672	14.128
Eagles Nest	87 26 32	267 15 47	4.36925	14.541
Lone Peak	108 52 25.99	288 38 46.29	4.5070077	19.969
Kremmling	138 57 19.53	318 46 43.44	4.5539286	22.247
Elk	174 01 40.81	353 59 42.14	4.6234818	26.112
Byers	231 42 46.97	51 47 46.36	4.1509118	8.796
Ptarmigan	337 29 48.03	157 31 44.82	4.0558764	7.067

WALDEN STANDPIPE, JACKSON COUNTY, COLO. (Not occupied.)

Standpipe in the town of Walden.
Signal and station mark: Center of standpipe.
Sighted from two stations; position doubtful.

[Latitude 40° 43′ 46.1″. Longitude 106° 16′ 38.7″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Shipman	236 50 31	56 58 21	4.30454	12.53
Richthofen	311 31 53	131 46 51	4.63765	26.97

WHITELEY, GRAND COUNTY, COLO.

On the highest part of the Whiteley Mountain about 1.5 miles north of Muddy Creek, and about 25 miles north of Kremmling by the Kremmling-Steamboat road. The station is about 2 miles northeast of Martin post office on Muddy Creek, from which a good trail leads around the north side of the mountain to gap at east side, from which the station was reached. Pack animal was taken to the top, but climbing was rough. There was water in gap of timber on west side of draw to north, about 800 feet from gap. Water can also be had farther down the draw. Feed good.

Signal: Cairn 7 feet high with pine tree in center.

Station mark: United States Geological Survey bronze tablet, set in 6 by 8 by 24 inch stone, over which was built the cairn, 7 feet high, with pine tree in center.

[Latitude 40° 19′ 04.948″. Longitude 106° 29′ 33.500″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Piney	00 21 47.57	180 21 38.05	4.7438366	34.450
Gore	53 04 50	232 58 29	4.24118	10.83
Flattop	56 23 04.51	236 00 14.75	4.7815885	37.578
Rabbit Ears	140 32 49.36	320 28 15.12	4.1960495	9.759
Elk	299 01 58.01	119 16 06.32	4.5507498	22.085
Kremmling	339 30 29.59	159 35 56.28	4.5352979	21.313
Lone Peak	353 55 47.44	173.58 08.01	4.6905859	30.474

WHITE PINE, LARIMER COUNTY, COLO. (Not occupied.)

Highest tree on summit of White Pine Mountain, which lies between the headwaters of Big Thompson River and Buckhorn Creek.

Signal and station mark: Highest tree on summit.

[Latitude 40° 36′ 18.0″. Longitude 105° 26′ 44.9″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Hague	51 47 24.9	231 39 36.9	4.33404	13.41
North Bald	131 41 41.3	311 31 47.3	4.45656	17.78
Livermore	217 31 54.7	37 37 56.0	4.32922	13.26
Horsetooth	288 51 00.5	109 00 45.0	4.34920	13.89

AMES, ALBANY COUNTY, WYO. (Not occupied.)

Ames monument on summit of the Sherman Hill near the town of Sherman, on the Union Pacific Railroad. The monument is about 25 feet high, and was built by the Union Pacific Railroad.

Station mark and signal: Apex of monument.

[Latitude 41° 07′ 52.3″. Longitude 105° 23′ 51.3″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Dead Tree	46 01 55	225 52 43	4.43625	16.98
Gale	59 25 02	239 17 27	4.27349	11.67
Twin	310 01 09	130 06 17	4.15523	8.88

GALE, ALBANY COUNTY, WYO.

A prominent rocky peak near the north end of Boulder Ridge about 1½ miles north of Colorado-Wyoming boundary line. About 9 miles southwest of Tie Siding and 500 yards north of road from there to North Park via Boulder Ridge. About 5 miles northwest of well-known rocky peak called Diamond Peak.

Station mark: A bronze triangulation tablet cemented in solid rock.

Signal: A pole quadripod with flags and target.

[Latitude 41° 02′ 42.170″ (K); 41° 02′ 42.12″ (T). Longitude 105° 35′ 23.180″ (K); 105° 35′ 22.88″ (T)]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Black	11 58 23.6	191 56 29.6	4.29299	12.20
South Bald	15 23 03.88	195 18 54.70	4.5270298	20.911
North Bald	17 08 24.80	197 00 07.62	4.4948318	19.417
Dead Tree	20 14 37.57	200 13 00.16	4.0014830	6.235
Little Bald	34 12 32.58	214 05 59.14	4.3980700	15.539
Bull	55 33 35.26	235 23 59.04	4.3967232	15.491
Red	79 12 14.59	258 58 40.34	4.4701158	18.343
Jelm (K)	100 13 24.05	279 58 09.24	4.5187672	20.517
Jelm (T)	100 13 17.46	279 58 02.71	4.5187373	20.516
Ames	239 17 27	59 25 02	4.27349	11.67
Twin	269 07 07.21	89 19 49.38	4.4331210	16.845
Cap Rock	303 29 36.10	123 35 01.77	4.1434427	8.646
Livermore (K)	321 44 50.36	141 56 32.72	4.6089706	25.253
Livermore (T)	321 44 53.11	141 56 35.40	4.6089354	25.252
Diamond	340 33 10	160 34 22	3.88797	4.81

NOTE.—(K)=values obtained by Kendall from the southeast; (T)=values obtained by Tatum from the south.

JELM, ALBANY COUNTY, WYO.

Situated about 3 miles east-southeast of Woods post office on the highest part of the mountain by that name. A tripod of poles erected over center.

Station mark: A bronze triangulation tablet cemented in solid rock.

[Latitude 41° 05′ 49.810″ (K); 41° 05′ 49.71″ (T). Longitude 105° 58′ 35.600″ (K); 105° 58′ 35.22″ (T).]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Shipman	15 54 30.39	195 50 32.61	4.4914620	19.267
Twin	274 57 51.29	95 25 48.70	4.7770594	37.189
Gale (K)	279 58 09.24	100 13 24.05	4.5187672	20.517
Gale (T)	279 58 02.71	100 13 17.46	4.5187373	20.516
Dead Tree	297 30 12.12	117 43 48.71	4.5158409	20.379
Little Bald	324 57 45.72	145 06 25.18	4.5094200	20.080
North Bald	326 38 49.41	146 49 44.44	4.6298236	26.496
Bull	328 52 08.02	148 57 45.15	4.3665273	14.450
Red	342 40 01.03	162 41 40.76	4.0760940	7.404

NOTE.—(K)=values obtained by Kendall from the southeast; (T)=values obtained by Tatum from the south.

TWIN, LARAMIE COUNTY, WYO.

A station of the United States Coast and Geodetic Survey.

On the highest point of the more eastern one of the two peaks known as Twin Mountain, about 20 miles a little south of west from Cheyenne and 7 miles by road southwest

of Granite Canyon, a station on the Union Pacific Railroad. The station is marked by a standard disk of the United States Coast and Geodetic Survey, is 0.15 meter above the station and 3.494 meters distant in azimuth 159° 58′. The bronze tablet marking the United States Geological Survey triangulation station "East Twin" is 0.16 meter above the station and 2.674 meters distant in azimuth 96° 08′. Azimuth observations were made at this station.

[Latitude 41° 02′ 54.064″. Longitude 105° 16′ 02.530″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Livermore	3 39 06.44	183 38 08.85	4.5104191	20.127
Hague	27 09 54.59	206 55 04.95	4.8468583	43.673
North Bald	50 23 31.46	230 06 34.16	4 6746935	29.379
Cap Rock	62 38 23.72	242 31 07.75	4.2427743	10.867
Gale	89 19 49.38	269 07 07.21	4.4331210	16.845
Jelm	95 25 48.70	274 57 51.29	4.7770594	37.189
Ames	130 06 17	310 01 09	4.15523	8.88
Horsetooth	353 54 24.76	173 57 12.15	4.7543881	35.297

IDAHO.

TRIANGULATION STATIONS.

Ammon, Cranes Flat, Henry, Irwin, Lanes Creek, Malad City, Mink Creek, Pocatello, Portneuf, Shelley, Soda Springs, and Sterrett quadrangles.

BANNOCK, BEAR LAKE, BINGHAM, BONNEVILLE, FRANKLIN, AND ONEIDA COUNTIES.

The following geographic positions were determined in 1915 by T. M. Bannon and H. H. Hodgeson and are based on United States Coast and Geodetic Survey preliminary positions of triangulation stations Henry and Woodall, North American datum.

ALEXANDER, BANNOCK COUNTY, IDAHO. (Not occupied.)

On the northwest end of old volcanic crater, about 2½ miles west of Alexander. One-half mile south of Oregon Short Line Railroad, one-half mile north of the wagon road west from Alexander to Central and Lund. A north-south section line passes by the station. Easily reached from the ranch at the northwest foot of mountain.

Reference marks: (1) A tablet 12.25 feet east; (2) chiseled cross on rock 51 feet southwest at the outer edge of base of mountain. (The latter was the instrument station.)

Station mark: An iron rod driven in the ashes under a big monument.

[Latitude 42° 39′ 19.2″. Longitude 111° 44′ 57.3″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Baldy	42 41 14	222 34 04	4.32271	13.064
Backbone	165 16 56	345 14 53	4.21143	10.110
Tenmile	187 16 51	7 17 28	3.98547	6.009

BACKBONE, BANNOCK COUNTY, IDAHO.

About 5 miles southeast of Hatch, on highest point of rocky backbone, about 4 miles northwest of Tennile Pass. It is in the southeast corner of sec. 20, T. 7 S., R. 40 E., Boise meridian. The station can best be reached from the east side.

Signal: Cedar tree, bushy top, cairn around base and centered over station mark.

Reference mark A: Chiseled cross in rock, distant from station 10 feet and in true azimuth 321° 31′.

Reference mark B: Chiseled cross in rock, distant from station 5 feet and in true azimuth 76° 02′.

Station mark: Bronze triangulation tablet cemented in rock.

[Latitude 42° 47′ 49.27″. Longitude 111° 47′ 59.23″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Baldy	17 56 30.10	197 51 30.28	4.5157369	20.375
Lund	39 25 20	219 18 58	4.30511	12.545
Bancroft	39 53 10	219 49 41	4.03831	6.787
Thirty-five	75 32 34	255 25 24	4.17266	9.247
Putnam	120 22 18	300 07 28	4.53739	21.416
Twenty-four Mile	157 20 45.20	337 17 23.37	4.2421081	10.851
Corral	219 25 14.80	39 30 17.48	4.2013538	9.879
Woodall	281 58 17.14	102 09 45.24	4.3720733	14.636
Three Mile	298 16 49	118 25 59	4.31886	12.948
Ten Mile	318 51 32.25	138 54 12.39	3.9113267	5.066
Alexander	345 14 53	165 16 56	4.21143	10.110

BALDY, BANNOCK COUNTY, IDAHO.

Sharp peak known as Baldy Mountain, in sec. 29, T. 10 S., R. 39 E., on the divide between Bear River and Marsh Lake of Portneuf River.

Signal and station mark: Seven-foot rock cairn.

[Latitude 42° 30′ 58.06″. Longitude 111° 55′ 21.70″]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Cottonwood	16 37 31	196 35 48	4.08625	7.578
Oxford	27 46 50.92	207 39 47.33	4.4898346	19.195
Elkhorn	66 23 02	246 08 05	4.52073	20.610
Lund	170 01 38	350 00 17	4.19960	9.839
Bancroft	187 38 59	7 40 16	4.36218	14.306
Backbone	197 51 30.28	17 56 30.10	4.5157369	20.375
Tenmile	211 36 04.41	31 43 43.79	4.4689889	18.295
Alexander	222 34 04	42 41 14	4.32271	13.064
Soda	280 13 09.98	100 28 20.42	4.4954038	19.443
Paris	318 18 03.46	138 33 11.27	4.6671326	28.872
Cleveland	332 37 47	152 44 11	4.46028	17.932
Treasureton	348 04 12.53	168 06 38.66	4.3803534	14.918

BANCROFT, BANNOCK COUNTY, IDAHO. (Not occupied.)

Steel railroad water tank in the town of Bancroft, Idaho.

Station mark and signal: Center of tank.

[Latitude 42° 43′ 17.5″. Longitude 111° 53′ 07.1″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Baldy	7 40 16	187 38 59	4.36218	14.306
Backbone	219 49 41	39 53 10	4.03831	6.787
Tenmile	259 40 09	79 46 18	4.09930	7.810

BLACKFOOT, BINGHAM COUNTY, IDAHO.

On bare summit near the south end of Blackfoot Mountains, near the head of and on the west side of Brush Creek. It is about 2 miles west of an old sawmill site in Brush Creek and the signal can be seen from near this site. To reach Blackfoot triangulation station the best route is to follow the road up left fork of Mill Creek from the Mill Creek crossing of the Blackfoot Dam and Idaho Falls road. Cross over the head of Mill Creek into Brush Creek drainage and continue on road to the old sawmill site mentioned above. Thence up Brush Creek for about 1 mile, thence climb to summit of ridge on left and follow ridge north to station. An abundance of good water in Brush Creek at the old sawmill site.

Signal: Pine tree, brushy top, cairn around base and centered over station mark.

Reference mark A: Chiseled cross in rock, distant from station 3.6 feet, true azimuth 338° 09′.

Reference mark B: Chiseled cross in rock, distant from station 5.8 feet, true azimuth 36° 05′.

Station mark: Bronze triangulation tablet cemented in rock.

[Latitude 43° 11′ 52.48″. Longitude 111° 52′ 29.89″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Twenty-four Mile	1 11 15.36	181 10 57.61	4.4537756	17.665
Higham	69 45 28.18	249 36 56.50	4.2556054	11.193
Sugarloaf	266 03 12.14	86 14 54.13	4.3655046	14.416
Paradise	318 50 57.61	138 54 39.75	4.0475095	6.932

CAMP, BANNOCK COUNTY, IDAHO.

In the northeast corner of sec. 29, T. 5 S., R. 42 E., Boise meridian. It is about 7 miles north from the town of Henry on summit of sharp ridge northwest of Goose Lake. Can be reached from any direction.

Station mark: Bronze triangulation tablet cemented in rock.

Signal: Flagpole, cairn around base and cemented over station mark.

Reference mark A: Chiseled cross in rock, distant from station 8.8 feet, true azimuth 306° 11′.

Reference mark B: Chiseled cross in rock, distant from station 11.3 feet, true azimuth 106° 20′.

[Latitude 42° 57′ 43.4″. Longitude 111° 33′ 04.4″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Corral	59 19 18	239 14 12	4.07424	7.372
Limerock	141 30 08	321 27 57	3.84322	4.331
Henry	290 35 57	110 41 58	4.11006	8.006

CARIBOU, BONNEVILLE COUNTY, IDAHO.

On highest peak on Caribou Mountain, which is a high, isolated mountain 7 or 8 miles east of John Gray Lake. This station can best be reached from Gray, Idaho, by following road up the north fork of Eagle Creek to the Evergreen mine, thence by trail to the second saddle south of station; thence along ridge north. Can take animals to station. An abundance of good water in head of North Eagle Creek.

Signal: Pine tree, brushy top cairn around base and centered over station mark.

Reference mark A: Chiseled cross in rock, distant from station 18.9 feet, true azimuth 50° 58′.

Reference mark B: Chiseled cross in rock, distant from station 27.1 feet, true azimuth 356° 24′.

Station mark: Bronze tablet cemented in rock.

[Latitude 43° 05′ 37.58″. Longitude 111° 18′ 39.31″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Henry	21 31 05.56	201 27 18.23	4.3140253	12.805
Grays Lake ranger station	37 57 00.00	217 54 17.00	3.94288	5.448
Corral	55 20 02.89	235 05 06.13	4.5594929	22.534
Limerock	69 06 14.83	248 54 13.47	4.4084954	15.916
Paradise	94 51 10.94	274 31 45.20	4.5877197	24.047
Sugarloaf	120 07 18.34	299 55 50.84	4.4188445	16.300

CLEVELAND, BANNOCK COUNTY, IDAHO.

On a rocky-topped, grassy hill divide, at the extreme east head of Battle Creek. Visible from both Treasureton, 5 miles west, and Cleveland, 5 miles northeast. The Oneida power plant on Bear River is at the east foot of hill or mountain 2 miles distant.

Reference mark: A tablet cemented in solid rock 13 feet northeast.

Station mark: A chiseled cross on solid rock under a large monument.

[Latitude 42° 17′ 07.0″. Longitude 111° 45′ 42.5″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Oneida	30 56 26	210 54 04	3.54830	2.196
Clifton	50 25 06	230 17 29	4.30632	12.580
Oxford	86 35 33	266 22 09	4.44280	17.225
Treasureton	104 33 48	284 29 44	3.93340	5.330
Baldy	152 44 11	332 37 47	4.46028	17.932
Surge	176 01 27	356 01 32	4.45941	17.896
Soda	221 13 19	41 21 57	4.42568	16.559

CLIFTON, ONEIDA COUNTY, IDAHO.

On a lone hill in Cache Valley, north of Bear River and west of Battle Creek. About 2 miles southeast of Clifton, Idaho. The wagon road from Clifton to Preston passes along the west foot of the hill. The hill is between the present location of Oregon Short Line Railroad and the abandoned narrow-gage roadbed.

Station mark: A tablet cemented in rock under a very small monument and tree signal.

Reference mark: A chiseled cross on small rock cropping on the west slope of hill 35.25 feet west.

[Latitude 42° 10′ 08.33″. Longitude 111° 57′ 02.22″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Burgeson	8 55 47	188 54 19	4.28742	12.044
Oxford	132 52 02.15	312 46 07.53	4.2175164	10.253
Treasureton	205 44 00.94	25 47 34.16	4.2235743	10.397
Cleveland	230 17 29	50 25 06	4.30632	12.580
Oneida	234 16 14	54 22 57	4.22925	10.534
Paris	263 20 30.55	83 36 42.82	4.5242844	20.779
Doubletop	311 39 33	131 51 12	4.50711	19.976
Smart	326 30 28.72	146 35 31.60	4.2749506	11.703

CORRAL, BANNOCK COUNTY, IDAHO.

About 7 miles by road south of Blackfoot dam, on one of highest points on ridge lying directly west of and 10 miles from the town of Henry and on the west side of Blackfoot Storage Reservoir. It is the south part of sec. 8, T. 6 S., R. 41 E., Boise meridian. It can be reached easily from any direction.

Signal: Flagpole, rock cairn around base and centered over station mark.

Reference mark A: Chiseled cross in rock distant from station 12 feet and in true azimuth 222° 42′.

Reference mark B: Chiseled cross in rock distant from station 14 feet and in true azimuth 316° 55′.

Station mark: Bronze tablet cemented in rock.

[Latitude 42° 54′ 27.03″. Longitude 111° 40′ 34.19″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Tenmile	14 29 20.38	194 26 58.16	4.2792015	11.818
Backbone	39 30 17.48	219 25 14.80	4.2013538	9.879
Twenty-four Mile	102 55 21.85	282 46 56.72	4.2368640	10.720
Limerock	206 55 04.51	26 58 00.47	4.1111331	8.026
Caribou	235 05 06.13	55 20 02.89	4.5594929	22.534
Camp	239 14 12	59 19 18	4.07424	7.372
Henry	266 00 34.48	86 11 42.85	4.3486254	13.867
Woodall	323 03 45.50	143 10 11.77	4.3324755	13.361
Lake	315 11 44	135 15 41	4.05034	6.978

COTTONWOOD, BANNOCK COUNTY, IDAHO. (Not occupied.)

On a sharp prominent peak in sec. 1, T. 12 S., R. 38 E., on divide, west side of Cottonwood Creek, near the head of the creek, about 5 miles northeast of Swan Lake post office.

Station mark: Flag on highest point.

[Latitude 42° 24′ 38.8″. Longitude 111° 57′ 54.5″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Oxford	34 51 02	214 45 31	4.28043	11.852
Baldy	196 35 48	16 37 31	4.08625	7.578
Treasureton	324 18 50	144 22 59	4.16173	9.027

DAM, BANNOCK COUNTY, IDAHO.

The station is on the highest point of ridge about 3 miles west of Blackfoot dam. It can be reached easily by going northwest up long ridge from the center of sec. 11, T. 5 S., R. 40 E. Boise meridian; the station is on the highest part of this ridge.

Signal: Cairn 9 feet high centered over station mark.

Reference mark A: Chiseled cross in rock distant from station 11 feet southwest.

Reference mark B: Chiseled cross in rock distant from station 7.8 feet northwest.

[Latitude 43° 00′ 44.4″. Longitude 111° 46′ 29.2″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Twenty-four Mile	48 19 53	228 15 40	4.06949	7.292
Paradise	176 11 30	356 11 05	4.08776	7.605
Limerock	270 28 56	90 35 54	4.14264	8.630

ELKHORN, BANNOCK AND ONEIDA COUNTIES, IDAHO. (Not occupied.)

A station of the Wheeler Survey.

Station mark: Summit of peak.

[Latitude 42° 23′ 45.3″. Longitude 112° 17′ 30.4″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Baldy	246 08 05	66 23 02	4.52073	20.610
Treasureton	285 51 00	106 08 23	4.56582	22.865
Oxford	311 02 30	131 10 22	4.32804	13.224

GRAYS LAKE RANGER STATION, BONNEVILLE COUNTY, IDAHO. (Not occupied.)

Grays Lake ranger station is at the southeast end of John Gray Lake and is a square frame house, with a pyramid roof.

Station mark and signal: Center of house.

[Latitude 43° 01′ 53.5″. Longitude 111° 22′ 37.5″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Limerock	83 07 07	262 57 48	4.27118	11.602
Caribou	217 54 17	37 57 00	3.94288	5.448

HENRY, BANNOCK COUNTY, IDAHO.

About 6.5 miles nearly east of Henry post office, probably 1 mile north. It can be reached by road running toward south end of Grays Lake and then to north of canyon. From here trail by horseback to top of hill which is bald on top and all sides except on north, which is covered with pine trees. The top of hill is covered with small rock. Station is on highest part of peak.

Signal: Cairn 6 feet at base and 7 feet high, with small pine in middle with tuft on top.

Station mark: Tablet set under signal cairn.

[Latitude 42° 55′ 16.19″. Longitude 111° 24′ 12.59″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Woodall	26 40 50.00	206 36 08.92	4.3209418	13.010
Lake	56 38 11	236 30 33	4.23600	10.699
Corral	86 11 42.85	266 00 34.48	4.3486254	13.867
Camp	110 41 58	290 35 57	4.11006	8.006
Limerock	121 26 35.03	301 18 21.99	4.2833539	11.932
Caribou	201 27 18.23	21 31 05.56	4.3140253	12.805

HIGHAM, BINGHAM COUNTY, IDAHO.

On Higham Peak in the southeast corner of T. 3 S., R. 37 E. Boise meridian, in the northeast corner of the Fort Hall Indian Reservation. It is at the head of Cold and Wood creeks and about 5 miles east of Old Fort Hall. A public road passes within a mile of the peak (and on the south side) and the climb to the summit from the road is easily made.

Station mark: Bronze tablet cemented in rock and stamped with the elevation above sea level, 6,725.

Signal: Aspen, brushy top, cairn around base and centered over station mark.

Reference mark A: Chiseled cross in rock, distant from station 28.4 feet, true azimuth 94° 00′.

Reference mark B: Chiseled cross in rock, distant from station 6.2 feet, true azimuth 200° 10′.

[Latitude 43° 08′ 29.84″. Longitude 112° 04′ 57.77″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Putnam	17 37 37	197 34 17	4.34140	13.638
Blackfoot	249 36 56.50	69 45 28.18	4.2556054	11.193
Paradise	274 58 03.45	95 10 16.78	4.3863043	15.124
Twenty-four Mile	323 32 23.14	143 40 35.86	4.4399866	17.113

LAKE, BANNOCK COUNTY, IDAHO.

Six miles south of Henry and 2 miles west of Dovell's shearing corral; on second hill north of China Hat. It is on south edge of the Blackfoot storage reservoir.

Station mark: Bronze tablet cemented in rock.

Signal: Flagpole, cairn around base and centered over station mark.

Reference mark A: Chiseled cross in rock, distant from station 10.5 feet southwest.

Reference mark B: Chiseled cross in rock, distant from station 8.35 feet northwest.

[Latitude 42° 50′ 08.7″. Longitude 111° 34′ 45.8″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Corral	135 15 41	315 11 44	4.05034	6.978
Henry	236 30 33	56 38 11	4.23600	10.699
Woodall	331 32 55	151 35 25	4.02098	6.522

LIMEROCK, BANNOCK COUNTY, IDAHO.

In the southwest corner of sec. 1, T. 5 S., R. 41 E. Boise meridian. On highest point of limestone ridge about 10 miles by road from the town of Henry and about 2 miles west of Meadow Creek Springs. It can be reached from Henry by following northward for about 4 miles the road to Wayan post office, thence by road westward across Meadow Creek, thence northwest to low saddle on the road from Grays Lake to Blackfoot Dam. From this point the station is about a 1,000-foot climb to northward.

Reference mark A: Chiseled cross in rock, distant from station 19.5 feet, true azimuth 152° 44′.

Reference mark B: Chiseled cross in rock, distant from station 11.5 feet, true azimuth 304° 48′.

Signal: Pine tree, brushy top, cairn around base and centered over station mark.

Station mark: Bronze tablet cemented in rock.

[Latitude 43° 00′ 40.16″. Longitude 111° 36′ 15.99″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Corral	26 58 00.47	206 55 04.51	4.1111331	8.026
Twenty-four-Mile	71 22 40.35	251 11 18.72	4.3788028	14.865
Paradise	130 06 11.46	309 58 48.18	4.2829820	11.922
Sugarloaf	182 58 55.42	2 59 30.60	4.3489896	13.878
Caribou	248 54 13.47	69 06 14.83	4.4084954	15.916
Grays Lake ranger station	262 57 48	83 07 07	4.27118	11.602
Henry	301 18 21.99	121 26 35.03	4.2833539	11.932
Dam	90 35 54	270 28 56	4.14264	8.630
Camp	321 27 57	141 30 08	3.84322	4.331

LUND, BANNOCK COUNTY, IDAHO. (Not occupied.)

Station mark: Dead tree.

[Latitude 42° 39′ 23.5″. Longitude 111° 57′ 22.1″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Backbone	219 18 58	39 25 20	4.30511	12.545
Soda	302 12 37	122 29 10	4.59818	24.634
Baldy	350 00 17	170 01 38	4.19960	9.839

ONEIDA POWER PLANT, BANNOCK COUNTY, IDAHO.

On a grassy hill ridge on west side of Bear River about 3 miles southwest of the Oneida power plant, 5 miles east of Treasureton. The power line passes through the pass just north of signal. Easily reached from Cleveland, Treasureton, or the power plant.

Station mark: Chiseled cross on rock under a large monument.

[Latitude 42° 15′ 28.7″. Longitude 111° 47′ 02.8″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Smart	7 36 19	187 34 56	4.41206	16.048
Clifton	54 22 57	234 16 14	4.22925	10.534
Treasureton	128 38 36	308 35 25	3.91944	5.162
Cleveland	210 54 04	30 56 26	3.54830	2.196
Doubletop	341 56 37	162 01 44	4.51729	20.448

OXFORD, ONEIDA COUNTY, IDAHO.

Coast and Geodetic Survey station about 6 miles west of the town of Oxford and about 15 miles east of Malad City, Idaho.

The best way to reach Oxford station is probably from the town of Oxford as this town is only 2 miles from the railroad station Oxford on the Oregon Short Line Railroad. There is a log road leading from the base of the mountain two-thirds of the distance to the summit, and from the end of this road a trail could be made with little labor to the summit.

This station was occupied by the Wheeler Survey about the year 1877; a rock cairn was found marking the place of their station. This cairn was torn down and a three-fourth-inch copper bolt was set firmly with lead in the solid surface rock, indicating the station selected by Assistant Welker. A heliotrope stand was erected at this point.

Four reference marks consisting of holes, drilled into ledges of rocks, each distant 22½ feet from the center station mark, were placed approximately north, south, east, and west.

[Latitude 42° 16′ 11.82″ (11.78[a]). Longitude 112° 05′ 49.96″ (49.95[a]).]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Elkhorn	131 10 22	311 02 30	4.32804	13.224
Baldy	207 39 47.33	27 46 50.92	4.4898346	19.195
Cottonwood	214 45 31	34 51 02	4.28043	11.852
Thatcher	234 08 24	54 18 02	4.39548	15.446
Soda	244 09 06.65	64 31 18.32	4.7004074	31.171
Treasureton	258 39 37.80	78 49 06.31	4.2953071	12 265
Cleveland	266 22 09	86 35 33	4.44280	17.225
Paris	279 06 48.20	99 28 56.16	4.6618328	28.522
Clifton	312 46 07.53	132 52 02.15	4.2175164	10.253
Smart	320 02 29.76	140 13 27.10	4.5451415	21.802

[a] Coast and Geodetic Survey preliminary value for 1915.

PARADISE, BINGHAM COUNTY, IDAHO.

On highest point on divide between Willow Creek to northeast and Paradise Creek to south and southwest of station. It is about 12 miles northwest of Blackfoot Dam from which place it can be reached via road to Idaho Falls which passes within a mile (and on east side) of base of mountain.

Signal: Pine tree, brushy top, cairn around base and centered over station mark.

Reference mark A: Chiseled cross in rock, distant from station 7.0 feet, true azimuth 89° 14′.

Reference mark B: Chiseled cross in rock, distant from station 5.1 feet, true azimuth 203° 16′.

Station mark: Bronze tablet cemented in rock.

[Latitude 43° 07′ 20.14″. Longitude 111° 47′ 05.15″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Twenty-four Mile	21 40 03.92	201 36 04.58	4.3331803	13.382
Putnam	58 52 07	238 36 33	4.55834	22.474
Higham	95 10 16.78	274 58 03.45	4.3863043	15.124
Blackfoot	138 54 39.75	318 50 57.61	4.0475095	6.932
Sugarloaf	237 44 48.47	57 52 47.80	4.2718678	11.620
Caribou	274 31 45.20	94 51 10.94	4.5877197	24.047
Limerock	309 58 48.18	130 06 11.46	4.2829820	11.922
Dam	356 11 05	176 11 30	4.08776	7.605

PARIS, BEAR LAKE COUNTY, IDAHO.

On high rocky peak about 6 miles west of Paris, Idaho, on the Wasatch Range. A trail leads from Paris up gulch to small lake on north side of peak where good water and a fine place to camp can be found.

Signal: A cairn 6 feet high and 4 feet in diameter on west point of summit.

Station mark: An aluminum tablet cemented in solid rock 6 feet northeast of cairn.

[Latitude 42° 12′ 11.46″. Longitude 111° 32′ 54.36″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Doubletop	20 16 33	200 12 02	4.42928	16.697
Clifton	83 36 42.82	263 20 30.55	4.5242844	20.779
Oxford	99 28 56.16	279 06 48.20	4.6618328	28.522
Treasureton	113 36 26.65	293 23 46.37	4.4512144	17.562
Baldy	138 33 11.27	318 18 03.46	4.6671326	28.872
Soda	180 01 24.95	0 1 25.30	4.4645239	18.108

PUTNAM, BANNOCK COUNTY, IDAHO. (Not occupied.)

A former station of the Hayden Survey on the northern of the two highest peaks of the Putnam Mountains, about 15 miles southeast of Rossfork, 15 miles northeast of Pocatello and 15 miles north of west from Chesterfield.

Station mark: A cairn 5 feet high.

[Latitude 42° 57′ 11.9″. Longitude 112° 09′ 51.0″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Higham	197 34 17	17 37 37	4.34140	13.638
Paradise	238 36 33	58 52 07	4.55834	22.474
Twenty-four Mile	273 00 46	93 12 18	4.36261	14.320

SMART MOUNTAIN,[1] FRANKLIN COUNTY, IDAHO.

Sharp rocky point 1.5 miles northeast of Franklin in sec. 19, T. 16 S., R. 40 E.

Signal and station mark: Large flagpole.

[Latitude 42° 01′ 39.00″. Longitude 111° 49′ 30.44″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Burgeson	75 41 03	255 34 33	4.14102	8.597
Oxford	140 13 27.10	320 02 29.76	4.5451415	21.802
Clifton	146 35 31.60	326 30 28.72	4.2749506	11.703
Treasureton	174 16 54.33	354 15 23.98	4.4905081	19.225
Oneida	187 34 56	7 36 19	4.41206	16.048
Doubletop	292 37 54	112 44 30	4.16872	9.164

SODA (SHERMAN PEAK), BEAR LAKE COUNTY, IDAHO.

On the highest of three peaks which lie about 10 miles south of Soda Springs and about 9 miles west of Georgetown. It is locally known as Sherman Peak. The station can be best reached by going from Georgetown by wagon to Mr. Minnick's sawmill on west side of Nounan Valley, thence on horseback west on trail up canyon to divide, then follow divide southward to peak, which is bald on top.

Signal: Rock cairn 7 feet at base and 7½ feet high.

Station mark: Tablet set under rock cairn.

[1] See p. 135.

[Latitude 42° 27′ 55.95″. Longitude 111° 32′ 53.84″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Paris	0 1 25.30	180 01 24.95	4.4645239	18.108
Cleveland	41 21 57	221 13 19	4.42568	16.559
Treasureton	55 28 29.91	235 15 47.36	4.4975961	19.541
Oxford	64 31 18.32	244 09 06.65	4.7004074	31.171
Thatcher	74 04 33	253 52 14	4.41575	16.185
Baldy	100 28 20.42	280 13 09.98	4.4954038	19.443
Surge	114 06 42	293 57 04	4.33033	13.296
Lund	122 29 10	302 12 37	4.59818	24.634
Tenmile	153 36 45.22	333 29 11.98	4.5348718	21.292
Woodall	184 23 46.87	4 24 59.88	4.5050444	19.879

SUGARLOAF, BINGHAM COUNTY, IDAHO.

On rocky summit of hill northwest of John Gray Lake (hill locally known as Sugar Loaf). It is between Grays Lake Outlet and Homer Creek, and can be reached easily from a public road (Grays Lake to Idaho Falls), which passes about 2 miles south of the peak.

Signal: Aspen, brushy top, cairn around base and centered over station mark.

Reference mark A: Chiseled cross in rock, distant from station 7.2 feet, true azimuth 294° 41′.

Reference mark B: Chiseled cross in rock, distant from station 7.4 feet, true azimuth 41° 14′.

Station mark: Bronze tablet cemented in rock.

[Latitude 43° 12′ 42.95″. Longitude 111° 35′ 24.51″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Limerock	2° 59 30.60	182 58 55.42	4.3489896	13.878
Paradise	57 52 47.80	237 44 48.47	4.2718678	11.620
Blackfoot	86 14 54.13	266 03 12.14	4.3655046	14.416
Caribou	299 55 50.84	120 07 18.34	4.4188445	16.300

SURGE, BANNOCK COUNTY, IDAHO. (Not occupied.)

A black steel surge tank at the Grace plant of the Utah Power & Light Co. It is located about 3 miles west from the town of Grace.

Station mark and signal: Center of tank.

[Latitude 42° 32′ 38.3″. Longitude 111° 47′ 09.7″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Tenmile	190 55 11	10 57 17	4.34972	13.902
Soda	293 57 04	114 06 42	4.33033	13.296
Cleveland	356 01 32	176 01 27	4.45941	17.896

TENMILE, BANNOCK COUNTY, IDAHO.

About 12 miles northwest of Soda Springs, on sharp point near north end of Soda Springs Hills and just south of Tenmile Pass, from which it can be easily reached.

Reference mark A: Chiseled cross in rock, distant from station 33.2 feet, true azimuth 61° 34′.

Reference mark B: Chiseled cross in rock, distant from station 28.6 feet, true azimuth 104° 52′.

Signal: Pine tree, brushy top, cairn around base and centered over station mark.

Station mark: Bronze triangulation tablet cemented in rock.

[Latitude 42° 44′ 30.22″. Longitude 111° 44′ 03.40″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Alexander	7 17 28	187 16 51	3.98547	6.009
Surge	10 57 17	190 55 11	4.34972	13.902
Baldy	31 43 43.79	211 36 04.41	4.4689889	18.295
Bancroft	79 46 18	259 40 09	4.09930	7.810
Thirty-five	97 01 58	276 52 03	4.29942	12.381
Backbone	138 54 12.39	318 51 32.25	3.9113267	5.066
Corral	194 26 58.16	14 29 20.38	4.2792015	11.818
Woodall	265 59 09.52	86 07 57.19	4.2485258	11.012
Threemile	286 04 46	106 11 12	4.13074	8.396
Soda	333 29 11.98	153 36 45.22	4.5348718	21.292

THATCHER, BANNOCK COUNTY, IDAHO. (Not occupied.)

On a bald rock-dome hill on the south end of the high ridge between Bear River and Cottonwood Creek. From the hill the ridge breaks off very suddenly to Cottonwood Creek. About 6 miles east of Thatcher and the same distance northwest of Cleveland, in sec. 12, T. 12 S., R. 39 E.

Station mark: Flag held up by guys and a few rocks.

[Latitude 42° 24′ 02.9″. Longitude 111° 51′ 09.1″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Treasureton	4 24 14	184 23 50	4.02983	6.655
Oxford	54 18 02	234 08 24	4.39548	15.446
Soda	253 52 14	74 04 33	4.41575	16.185

THIRTY-FIVE, BANNOCK COUNTY, IDAHO. (Not occupied.)

The summit of a low rock-capped hill in sec. 35, T. 8 S., R. 38 E. Boise meridian. There are apparently three large rocks on the summit of this hill, the south rock being the highest and is the point sighted in each case.

Station mark and signal: Apparent highest point.

[Latitude 42° 45′ 48.4″. Longitude 111° 58′ 32.9″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Twenty-four Mile	201 03 19	21 07 08	4.32768	13.214
Backbone	255 25 24	75 32 34	4.17266	9.247
Tenmile	276 52 03	97 01 58	4.29942	12.381

THREEMILE, BANNOCK COUNTY, IDAHO.

On the summit of a low hill about 3 miles north of Soda Springs and locally known as Threemile Hill. It is on the west side of the Soda Springs-Henry road, and the summit is easily reached.

Signal: Rock cairn centered over station mark.

Reference mark A: Chiseled cross in rock, distant from station 29 feet.

Reference mark B: Chiseled cross in rock, distant from station 54.2 feet.

Station mark: Bronze triangulation tablet cemented in large rock projection 3 feet above the ground.

[Latitude 42° 42′ 28.5″. Longitude 111° 34′ 33.0″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Tenmile	106 11 12	286 04 46	4.13074	8.396
Backbone	118 25 59	298 16 49	4.31886	12.948
Woodall	223 24 57	43 27 17	3.83554	4.255

TREASURETON, BANNOCK COUNTY, IDAHO.

Three miles north of Treasureton post office, on divide between Cottonwood and Battle creeks, on end of sharp hill in sec. 11, T. 13 S., R. 39 E.

Signal and station mark: Cairn 7 feet high; tablet under cairn.

[Latitude 42° 18′ 16.74″. Longitude 111° 51′ 45.03″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Clifton	25 47 34.16	205 44 00.94	4.2235743	10.397
Oxford	78 49 06.31	258 39 37.80	4.2953071	12.265
Elkhorn	106 08 23	285 51 00	4.56582	22.865
Cottonwood	144 22 59	324 18 50	4.16173	9.027
Baldy	168 06 38.66	348 04 12.53	4.3803534	14.918
Thatcher	184 23 50	4 24 14	4.02983	6.655
Soda	235 15 47.36	55 28 29.91	4.4975961	19.541
Cleveland	284 29 44	104 33 48	3.93340	5.330
Paris	293 23 46.37	113 36 26.65	4.4512144	17.562
Oneida	308 35 25	128 38 36	3.91944	5.162
Smart	354 15 23.98	174 16 54.33	4.4905081	19.225

TWENTY-FOUR MILE, BANNOCK COUNTY, IDAHO.

On west side of sec. 34, T. 5 S., R. 39 E. Boise meridian. It is about 6 miles north of the town of Chesterfield, on highest point of limestone ridge between Corral Creek and Portneuf River. It is about 2 miles north of Devils Pass and can be reached from any direction.

Reference mark A: Chiseled cross in rock, distant from station 6.7 feet, true azimuth 60° 10′.

Reference mark B: Chiseled cross in rock, distant from station 13.3 feet, true azimuth 148° 01′.

Signal: Pine tree, brushy top, cairn around base and centered over station mark.

Station mark: Bronze triangulation tablet cemented in rock.

[Latitude 42° 56′ 31.40″. Longitude 111° 52′ 55.88″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Thirty-five	21 07 08	201 03 19	4.32768	13.214
Putnam	93 12 18	273 00 46	4.36261	14.320
Higham	143 40 35.86	323 32 23.14	4.4399866	17.113
Blackfoot	181 10 57.61	1 11 15.36	4.4537756	17.665
Paradise	201 36 04.58	21 40 03.92	4.3331803	13.382
Limerock	251 11 18.72	71 22 40.35	4.3788028	14.865
Corral	282 46 56.72	102 55 21.85	4.2368640	10.720
Backbone	337 17 23.37	157 20 45.20	4.2421081	10.851
Dam	228 15 40	48 19 53	4.06949	7.292

WOODALL, BANNOCK COUNTY, IDAHO.

About 10 miles northeast of Soda Springs, on high, bald peak, and is in sec. 2, T. 8 S., R. 42 E. It is about 0.8 mile east of Mr. Woodall's ranch. It can be reached by wagon road from Soda Springs to Woodall's ranch, thence on horseback to top.

Station mark: Tablet set in rock under cairn 4 feet at base and 6 feet high, with small pine set in center of cairn.

Signal: Cairn 4 feet at base and 6 feet high, with small pine set in center of cairn.

[Latitude 42° 45′ 09.69″. Longitude 111° 31′ 06.00″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Soda	4 24 59.88	184 23 46.87	4.5050444	19.879
Threemile	43 27 17	223 24 57	3.83554	4.255
Tenmile	86 07 57.19	265 59 09.52	4.2485258	11.012
Backbone	102 09 45.24	281 58 17.14	4.3720733	14.636
Corral	143 10 11.77	323 03 45.50	4.3324755	13.361
Lake	151 35 25	331 32 55	4.02098	6.522
Henry	206 36 08.92	26 40 50.00	4.3209418	13.010

DOUBLETOP, CACHE COUNTY, UTAH. (Not occupied.)

Station mark: Summit of mountain.

[Latitude 41° 58′ 34.3″. Longitude 111° 39′ 38.8″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Smart	112 44 30	292 37 54	4.16872	9.164
Clifton	131 51 12	311 39 33	4.50711	19.976
Oneida	162 01 44	341 56 37	4.51729	20.448
Paris	200 12 02	20 16 33	4.42928	16.697

IDAHO AND MONTANA.

TRIANGULATION STATIONS.

Argo, Bay Horse, Casto, Custer, Dickey, Gibbons Pass, Junction, Mackay, May, Noble, Rabbit Foot, Salmon, Tilden, Trapper Peak, Vinegar Hill, and Watchtower Peak quadrangles.

BINGHAM, BLAINE, BOISE, CUSTER, FREMONT, IDAHO, AND LEMHI COUNTIES, IDAHO; BEAVERHEAD AND RAVALLI COUNTIES, MONT.

The following preliminary geographic positions were determined by T. M. Bannon in 1912 to 1915, inclusive. Positions north of stations Ram and Jerry, were originally computed on Hamilton-Helena mean datum (see Bull. 201) but 3.67″ has been subtracted from all latitudes and 1.37″ added to all longitudes to reduce them to approximate North American datum.

Positions, azimuths, and distances from Big Butte northwestward to Jerry were computed directly from preliminary values of United States Coast and Geodetic Survey stations Big Butte and Middle Butte on North American datum.

ADAMS SECTION CORNER, CUSTER COUNTY, IDAHO.

In center of east-west road starting from the Challis-Salmon road at Jack Adam's ranch. Northeast corner of Jack Adam's ranch.

Station mark: Section-corner stone.

[Latitude 44° 32′ 11.76″. Longitude 114° 11′ 32.47″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Twin	105 52 10.00	285 40 14.00	4.36906	14.535
Grouse	247 22 09.00	67 26 17.00	3.92696	5.252

1 A. P. 412, IDAHO-MONTANA BOUNDARY LINE (LEMHI COUNTY, IDAHO, AND RAVALLI COUNTY, MONT).

On a sharp rocky peak, timbered on south, summit Bitter Root Range at State line (Idaho-Montana) angle stone 1 A. P. 412 M. Easily reached by State-line trail which passes through the three saddles on the north, southeast, and west slopes of the peak. Good camping place in saddle on State-line trail at milepost 410. At milepost 409 cut-off trail goes north to Alta, joining wagon road near the forks of Hughes Creek. At milepost 407 trail goes southeast to Salmon River.

Station mark: A small chiseled hole in solid rock under a large rock monument.

Reference mark: A chiseled cross on stone marked "1 A. P. 412 M. I. M."

[Latitude 45° 35′ 31.5″ Longitude 114° 05′ 06.3″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Piquett	152 19 15.00	332 14 44.00	4.24641	10.958
Trapper	153 39 11.00	333 30 06.00	4.56852	23.008
Deer	182 50 17.00	02 51 37.00	4.68456	30.055
Rocky	260 52 16.00	80 53 37.00	3.38367	1.503

ANDERSON, CUSTER COUNTY, IDAHO.

On the highest rocky-topped grassy hill on divide between Worm Springs and Joe Anderson's fork of Road Canyon creeks, near their heads and about half a mile west of the main divide between Salmon and Lost rivers. About 6 miles a little south of west from Dickey. Visible from Mackey, Dickey, Chilly, and Challis. The hill is very prominent. Iron section corner post marked "T. 10 N., R. 21 E., secs. 7–8" is less than half a mile west, on same ridge east of the first saddle. Easily reached with horses from all directions. Good camping grounds at any of the numerous springs close by.

Station mark: A tablet set in solid rock over which a large monument is centered.

Reference marks: (1) A chiseled cross on solid rock 10.2 feet southwest; (2) a chiseled cross on solid rock 6 feet east.

[Latitude 44° 11′ 53.65″. Longitude 114° 01′ 23.86″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Jerry	23 42 00.73	203 38 30.38	4.2234693	10.395
Redwings	61 16 56.01	241 02 53.51	4.4873088	19.084
Spar	116 21 05.31	.....	4.0079358	6.328
Ram	126 29 51.15	.....	4.5016549	19.724
King	307 30 05.05	128 01 20.43	4.8814695	47.295
Mackay	322 46 05.29	142 59 35.09	4.6331939	26.702
Shelly	329 50 31.58	150 02 56.21	4.6782155	29.619
Porphyry	349 21 05.85	169 23 59.89	4.4801275	18.771

ANTE, CUSTER COUNTY, IDAHO.

On a flat long hill on main divide between East Fork of Lost River and Antelope Creek. The hill is between the heads of the two main forks of Cherry Creek, a tributary of Antelope Creek, and the extreme northeast head of East Fork of Lost River. About 5 miles east of Reed & Davis copper mine and 3 miles south of Shelly Mountain. Easily reached from all directions.

Station mark: A bench-mark tablet set in solid rock centered under a large monument.

Reference mark: A chiseled cross on solid rock 19.30 feet north.

[Latitude 43° 47′ 50.6″. Longitude 113° 44′ 56.3″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Smiley	24 10 03	204 07 33	4.07471	7.380
Crawford	290 04 13	110 15 41	4.37489	14.732
Blizzard	348 47 53	168 51 15	4.52900	21.006

ARCO, BLAINE COUNTY, IDAHO.

On the first high grassy hill on the limestone ridges, north side of Big Lost River, 2 miles due north of Arco City. About 3 miles southeast of J. D. Martin's ranch on Lost River.

Station mark: An aluminum bench-mark tablet set in solid rock under center of a 7-foot monument.

Reference mark: A chiseled cross on solid rock 10.7 feet north.

[Latitude 43° 40′ 00.92″. Longitude 113° 17′ 56.98″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Arco School	3 57 54	183 57 52	3.55916	2.254
Hades	21 11 44.08	201 04 49.13	4.5745275	23.328
Inferno	39 26 16	219 15 52	4.50622	19.933
Blizzard	58 02 22.29	237 47 07.32	4.5458668	21.838
Crawford	114 23 25.36	294 16 13.96	4.1860354	9.536
King	189 32 30.56	9 33 35.10	4.1002561	7.827
Jumpoff	237 41 55.08	57 49 54.50	4.2639317	11.410
East Butte	289 54 05.70	110 20 22.05	4.7374676	33.948
Middle Butte	293 06 11.91	113 29 25.57	4.6936166	30.688
Big Butte	323 10 34.06	143 22 01.73	4.5739009	23.294

ARCO SCHOOL, BLAINE COUNTY, IDAHO. (Not occupied.)

Center of large brick schoolhouse in town of Arco.

[Latitude 43° 38′ 03.7″. Longitude 113° 18′ 08.4″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Blizzard	63 07 03	242 51 56	4.52040	20.596
Crawford	125 57 33	305 50 30	4.22926	10.536
Arco	183 57 56	3 58 14	3.55958	2.254

BALDY, LEMHI COUNTY, IDAHO.

On the highest point in center of a large flat-topped rocky mountain, locally known as Baldy or Salmon City Peak. About 6 miles by trail southwest of Salmon City. Easily reached by following timber road and Forest Service telephone line to a point southeast of peak, thence by trail to station. The Forest Service has a signal station on the west end of peak, and a small monument was built on east end of peak to sight Salmon City.

Station mark: A triangulation tablet cemented into rock set under a large monument.

Reference mark: A chiseled cross on solid rock 17.4 feet southeast.

[Latitude 45° 08′ 43.45″. Longitude 114° 00′ 29.97″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Grouse	6 02 34.04	185 58 56.13	4.8113331	40.243
Taylor	29 32 36.87	209 23 49.98	4.5205800	20.603
Black Mountain	38 09 27.54	217 55 14.24	4.6324732	26.658
Red Rock	64 19 11.00	244 01 19.00	4.5659160	22.870
Middle Fork	68 29 05.84	248 01 38.91	4.7389049	34.061
M. P. 12	82 11 06.00	261 49 50.00	4.59916	24.689
Wilson	82 47 32.87	262 21 21.60	4.68914	30.373
Puddin	85 58 37.87	265 32 16.00	4.68941	30.392
Bee Hive	101 24 57.88	281 01 53.55	4.6378441	26.990
Blue Nose	143 13 13.26	322 58 20.14	4.6587317	28.320
Sheep	207 32 21.66	27 42 58.24	4.6238484	26.134
Goldstone	274 41 20.59	94 59 45.10	4.5337146	21.236
Mill	297 35 26.00	117 43 25.00	4.27413	11.680
Sal	317 41 20.43	137 48 24.08	4.2891545	12.092

BAY HORSE, CUSTER COUNTY, IDAHO. (Not occupied.)

On the second hill north of Bay Horse Creek and mining camp. Easily reached from the cut-off road from Challis to Bay Horse.

Station mark: Center of big monument.

[Latitude 44° 25′ 32.47″. Longitude 114° 21′ 23.75.″]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Twin	153 09 16.00	333 04 15.00	4.32112	13.016
Grouse	233 11 05.00	53 22 08.00	4.41569	16.182

BEAUTY, CUSTER COUNTY, IDAHO. (Not occupied.)

On the highest peak in the Big Lost River Range, divide between the waters of Pahsimeroi and Big Lost River. About 6 miles northeast and visible from Dickey post office on the Mackay-Challis stage road. Can be reached only by a long, difficult climb afoot. Best route up Rock Creek from Dickey.

Reference mark: A chiseled cross on solid rock 37 feet south.

Station mark: A hole drilled for tablet under center of large monument.

[Latitude 44° 08′ 16.4″. Longitude 113° 46′ 49.1″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Porphyry (from south)	31 13 58	211 06 44	4.42918	16.692
Jerry (from south)	71 53 36	251 39 57	4.44025	17.124
Anderson (from south)	109 07 13	288 57 38	4.31298	12.774
Redwings (from north)	80 17 45	259 53 34	4.67276	29.249
Twin (from north)	132 40 27	312 11 17	4.87564	46.664

BEE HIVE, LEMHI COUNTY, IDAHO.

On the highest of several rocky hills partly timbered, 4 miles northeast of Mount McGuire, about 0.5 mile northwest of the main divide between Middle Fork and Salmon rivers. The creek that empties into the Middle Fork near its junction with Salmon River heads in some lakes on both sides of the hill. The trail from the wagon road on the divide between Yellowjacket and Farney to Clear Creek, and down Clear Creek to Big Creek, passes about 4 miles north and east. About 34 miles northeast of Farney and Yellowjacket and 12 miles west of Shoup. Can be reached by following up the ridges from the river or from Clear Creek trail by taking the long timbered ridge at the big bend 7 miles from the passes between Wilson and Clear creeks.

Station mark: Triangulation tablet under monument.

Reference mark: A chiseled cross on solid rock 5.65 feet south.

[Latitude 45° 13′ 17.31″. Longitude 114° 33′ 01.44″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Middle Fork	15 57 59.73	195 53 33.85	4.4758179	18.586
Blue Nose	208 19 50.98	28 28 05.53	4.5026912	19.772
Baldy	281 01 53.55	101 24 57.88	4.6378441	26.990
Taylor	324 36 26.09	144 50 40.01	4.6600568	28.406

BELL (FINGER), FREMONT COUNTY, IDAHO. (Not occupied.)

On Bell Mountain, a high, prominent bell-shaped peak on the main backbone of Little Lost River Range. About 10 miles northeast of Clyde post office. Can be reached by a long difficult climb afoot.

Station mark: A bench mark tablet set in placed rock under center of large monument.

Reference mark: A chiseled cross on solid rock.

[Latitude 44° 14′ 11.62″ (from north); 44° 14′ 11.7″ (from south). Longitude 113° 11′ 35.00″ (from north) 113° 11′ 35.4″ (from south)].

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Horse Prairie (from north)	184 22 36	4 24 58	4.76622	36.272
E and W (from north)	164 11 14	344 01 18	4.83559	42.554
King (from south)	7 13 11	187 09 51	4.70993	31.863
Jumpoff (from south)	352 33 38	172 37 15	4 73201	33.524

BEND, IDAHO COUNTY, IDAHO. (Not occupied.)

Highest peak south of Salmon in the vicinity where Lemhi, Idaho, and Salmon counties join.

[Latitude 45° 18′ 37.5″. Longitude 114° 47′ 06.5″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Blue Nose			4.58088	23.672
Trapper			4.87441	46.533
Rocky			4.81526	40.608
Piquett			4.81975	41.030

BENCH MARK 49, CUSTER COUNTY, IDAHO.

Cooperative bench-mark post at a corner of a fence on the main Challis-Salmon stage road about 3 miles northeast of Challis and 0.25 mile southwest of Jack Adams's ranch.

Station mark: Bench-mark post 49, elevation 4937.

[Latitude 44° 31′ 52.73.″ Longitude 114° 12′ 09.05″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Twin	107 50 16.00	287 38 46.00	4.35774	14.161
Grouse	245 57 31.00	66 02 05.00	3.97436	5.858

BIG BUTTE, BLAINE COUNTY, IDAHO.

A United States Coast and Geodetic Survey station on "Big Butte," a well-known landmark on the Lavas between Big Lost and Snake rivers, 4 miles south of Cerro Grande siding on the Mackay branch of the Oregon Short Line Railroad. Water at Hollau Springs on the east side and Lozier Springs on the north side. Tabor post office and station is the nearest supply point. Easiest ascended from the north side.

Station mark: A United States Coast and Geodetic Survey tablet.

Reference mark: A United States Geological Survey bench-mark tablet in placed rock centered under large monument 11 feet west.

[Latitude 43° 23′ 47.33″. Longitude 113° 01′ 18.56″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Hades	82 18 06.88	261 59 47.29	4.5609470	22.610
Blizzard	102 29 45.13	282 03 05.83	4.7284855	33.253
Arco	143 22 01.73	323 10 34.06	4.5739009	23.294
Jumpoff	170 17 36.87	350 14 06.88	4.6066291	25.118
Middle Butte	245 20 45.83	65 32 29.48	4.4030997	15.720
East Butte	248 38 48.63	68 53 34.45	4.4923903	19.308

BIG HOLE PASS, IDAHO-MONTANA BOUNDARY LINE, LEMHI COUNTY, IDAHO, AND BEAVERHEAD COUNTY, MONT.

On a grassy hill on the Continental Divide, Idaho-Montana boundary line. About 1 mile south of the Big Hole Pass, through which the new road from Gibbonsville, Idaho, to the Big Hole Valley passes. The old wagon road, now used as a trail, came up a ridge from Gibbonsville almost west from the station. Good camping grounds and water in the pass on the new road.

Station mark: The 3 A. P. 444 M State boundary line.

Reference mark: Nail driven in blazed tree 94.7 feet east.

[Latitude 45° 32′ 30.38″. Longitude 113° 49′ 31.87″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Rocky	108 34 30.00	288 24 41.00	4.27502	11.705
Ruby	232 13 56.00	52 17 16.00	3.88587	4.778

BLACK CAP, BLAINE COUNTY, IDAHO.

On a low, grassy peak east side of the mouth of Dry Fork of Antelope Creek valley. The peak has a peculiar capping of black rock. About 3 miles east of Grouse post office, Miller's ranch. Section corner between secs. 20, 21, 29, and 28, at ranch, is about 2,700 feet southeast. The Dry Fork of Antelope Creek curves around the south and east foot of the peak. Easily reached from the ranches in the vicinity of Grouse School.

Station mark: A large nail driven between rocks centered under a large monument.

[Latitude 43° 39′ 40.1″. Longitude 113° 36′ 40.0″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Smiley	105 07 44	284 59 41	4.21874	10.282
Shelly	153 26 42	333 21 57	4.31382	12.799
Crawford	237 59 48	58 05 32	4.11927	8.178

BLACK MOUNTAIN, CUSTER COUNTY, IDAHO.

On a high rocky peak on main divide. Water to the east, south, and west drains into Camas Creek; that to the north into Panther Creek. Morgan Creek heads 1 mile east. The wagon road from Forney to Challis, where it passes over the main divide between Panther and Morgan creeks, is about 4 miles northeast of peak. Forney is about 10 miles northwest. Rabbitfoot mine is about 4 miles northwest. The ranger station on Panther Creek at the mouth of Opal Lake Creek is about 4 miles north. Good camping ground at the base of the peak.

Station mark: A chiseled cross on rock set under monument.

Reference mark: A triangulation tablet in solid rock 19.7 feet northwest.

[Latitude 44° 50′ 28.88″. Longitude 114° 20′ 36.84″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Middle Fork	118 51 41.22	298 38 30.60	4.4475912	17.416
Forney	183 52 35.93	3 53 02.83	4.0918756	7.678
Baldy	217 55 14.24	38 09 27.54	4.6324732	26.658
Taylor	244 03 48.05	64 09 13.92	4.0519739	7.003

BLIZZARD, BLAINE COUNTY, IDAHO.

On Iron Mountain, the highest rocky-topped grassy hill of Antelope Mountains, at the head of Lava and Cottonwood creeks to the north and east, and Iron Mine Creek and Fish Creek to the south and west. The hill is on the main divide between Lost River and Wood River drainage, about 6 miles due west of Martin post office and ranch, 30 miles southwest and visible from Arco town, 10 miles east of Crooks post office. Easily reached by following up Fish Creek from the west or Lava and Cottonwood creeks from north and east, quarter-section corner between secs. 24, 25, T. 2 N., R. 23 E., is on the east end of hill several hundred feet from top on north slope.

Station mark: A tablet set in placed rock under center of large monument.

Reference marks: (1) A chiseled cross on solid rock 8.7 feet southeast; (2) center of a smaller monument on east end of hill 141 feet east.

[Latitude 43° 29′ 55.97″. Longitude 113° 40′ 04.17″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Buzz	65 47 03	245 35 06	4.41015	15.97
Freedom	92 54 16	272 46 33	4.18023	9.41
Garfield	114 42 07	294 29 08	4.44566	17.34
Scorpion	130 22 51.43	310 13 53.10	4.3614759	14.283
Pion	134 48 17	314 41 02	4.30030	12.41
Smiley	152 57 16.65	332 51 25.44	4.3993359	15.584
Crawford	212 09 54.03	32 17 58.74	4.4705007	18.359
Arco	237 47 07.32	58 02 22.29	4.5458668	21.838
Martin	260 55 45	81 00 13	3.94707	5.501
Hades	315 01 09.21	135 09 27.23	4.3632852	14.343

BONANZA, CUSTER COUNTY, IDAHO.

On a rocky hill having scattering trees on top at the heads of Adair and Ramey creeks. It is the south one of two hills on the ridge south from the forks of Jordan and Yankee Fork creeks. About 3 miles south of Custer and the same distance southeast of Bonanza. Easily reached by trail up Adair Creek from Custer to the Black mine.

Station mark: A chiseled cross on rock set under a large rock monument and tree signal.

Reference mark: A chiseled cross on solid rock 12.3 feet west.

[Latitude 44° 21′ 27.03″. Longitude 114° 41′ 25.72″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Mount Eustes	170 35 44.78	350 34 53.29	3.9981961	6.188
Ram	267 32 27.43	87 47 01.06	4.4423271	17.206

BUZZ, BLAINE COUNTY, IDAHO. (Not occupied.)

On the west of the two highest hills on the grassy ridge dividing the waters of Fish and Muldoon creeks, about 5 miles south of Laidlow's big ranch on Muldoon Creek, 6 miles north and visible from Carey post office.

Station mark: Center of monument.

[Latitude 43° 24′ 12.9″. Longitude 113° 57′ 26.3″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Scorpion	192 56 37	12 59 37	4.41703	16.233
Freedom	216 08 38	36 12 49	4.14758	8.728
Blizzard	245 35 06	65 47 03	4.41015	15.974
Crooks	.....	85 02 04	4.12860	8.355
Hades	278 04 55	98 24 56	4.60395	24.963

CHALLIS, CUSTER COUNTY, IDAHO.

On the first sagebrush hill on the divide between Garden and Challis creeks. About 1½ miles northwest of Challis and 1 mile north of Alexander Klug's ranch on Garden Creek, 2 miles west of Challis. The station commands a good view of the Challis Valley. Easily reached from Challis in any direction.

Station mark: Triangulation tablet set in rock under large monument.

Reference mark: A chiseled cross on big rock standing 1 foot out of the ground 16.8 feet south.

[Latitude 44° 31′ 01.49″. Longitude 114° 15′ 46.30″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Twin	116 49 40	296 40 42	4.27740	11.769
Grouse	247 56 43	68 03 49	4.16020	8.986

CHILLY, CUSTER COUNTY, IDAHO.

On the highest point of a low isolated hill in Chilly Valley, about 2 miles west of Chilly post office and 5 miles south of Dickey post office. The junction of Thousand Springs Creek with Big Lost River at the Big Bend is about 4 miles southeast. Easily reached from Chilly and Dickey.

Station mark: A chiseled cross, hole with two big nails centered under a small rock monument.

Reference mark: A bench-mark aluminum tablet set in solid rock 9.4 feet north.

[Latitude 44° 04′ 35.9″. Longitude 113° 54′ 04.3″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Jerry	83 48 52	263 40 16	4.22021	10.317
Anderson	144 10 13	324 05 07	4.22204	10.361
Mackay	322 01 08	142 09 20	4.42010	16.347

COPPER BASIN RANGER STATION, CUSTER COUNTY, IDAHO. (Not occupied.)

Small house painted white, used as ranger station. About 25 miles southwest of Mackay by wagon road across the hills and 1 mile west of Reed & Davis copper mine camp, in Copper Basin.

Station mark: Center of house.

[Latitude 43° 48′ 28.5″. Longitude 113° 50′ 04.1″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Reed & Davis	124 04 43	.....	3.26715	1.150
Porphyry	145 00 19	324 55 21	4.22285	10.380
Shelly	256 25 00	76 29 31	3.95473	5.599

CRAWFORD, BLAINE COUNTY, IDAHO.

On Appendicitis Hill, the highest point of the grassy ridges between Antelope Creek and the Lavas, 20 miles west and visible from Arco town, 8 miles south of Darlington post office, 3 miles east of E. S. Crawford's ranch on Antelope Creek, the easiest and shortest climb to station.

Station mark: A triangulation tablet set in solid rock centered under a large monument.

Reference mark: A chiseled cross on solid rock 16.1 feet northwest.

[Latitude 43° 43′ 25.80″. Longitude 113° 28′ 21.45″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Inferno	11 30 15	191 27 01	4.50194	19.737
Timbered Dome (tree)	24 24 52	204 21 28	4.12713	8.327
Blizzard	32 17 58.74	212 09 54.03	4.4705007	18.359
Black Cap	58 05 32	237 59 48	4.11927	8.18
Scorpion	73 12 10.89	252 55 06.14	4.5408977	21.590
Smiley	84 30 27.01	264 16 29.47	4.4355977	16.941
Ante	110 15 41	290 04 13	4.37489	14.734
Shelly	119 26 16.39	299 15 46.33	4.3685909	14.519
Mackay	135 20 40.04	315 11 14.08	4.4143959	16.134
King	249 08 12.41	69 16 28.82	4.2350095	10.675
Arco	294 16 13.96	114 23 25.36	4.1860354	9.536
Arco School	305 50 30	125 57 33	4.22926	10.535
Hades	359 19 13.97	179 19 28.99	4.6164004	25.689

CROOKS, BLAINE COUNTY, IDAHO.

On Pine Mountain, a prominent rocky, partly grassed hill, with scattered trees near top, about 1.5 miles east of the main forks of Fish Creek. About 4 miles south and visible from Rawls ranch, Crook post office, 15 miles northeast of Carey, the nearest supply point. The old Crooks ranch on Fish Creek is at the north foot of hill. The ridge on which the hill is located divides Fish Creek and drainage to the Lava Beds.

Station mark: A chiseled cross on flat solid rock under a monument.

Reference marks: (1) A bench-mark tablet set in big bowlder 4 feet east; (2) a trimmed lone spruce tree about center of hill 133 feet west.

[Latitude 43° 24′ 51.0″. Longitude 113° 47′ 30.8″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Buzz	85 02 04		4.12860	8.355
Freedom	153 23 52	333 21 16	4.05567	7.064
Scorpion	162 50 37	342 46 47	4.40511	15.793
Hades	284 37 36	104 51 30	4.43546	16.936

COPPER BASIN KNOB, CUSTER COUNTY, IDAHO. (Not occupied.)

The highest rocky knob on the divide between the main head of the East Fork of Lost River and Lake Creek.

About 3 miles south and visible from Reed & Davis copper mine.

Mark: None.

[Latitude 43° 45′ 21.9″. Longitude 113° 50′ 52.9″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Porphyry	156 24 11	336 20 16	4.32668	13.183
Shelly	231 20 18	51 25 23	4.10078	7.839
Smiley	333 26 28	153 28 04	3.84400	4.339

DIAMOND (THUMB), FREMONT COUNTY, IDAHO. (Not occupied.)

On Diamond Peak, a high, very sharp peak on the main backbone of Little Lost River Range. About 10 miles southeast of Clyde post office and the same distance southwest of Kaufman post office.

Station mark: A tablet set in solid rock over which a large monument is centered.

Reference mark: A chiseled cross on solid rock 18 feet south.

[Latitude 44° 08′ 30.13″ (from north); 44° 08′ 30.5″ (from south). Longitude 113° 04′ 54.78″ (from north); 113° 04′ 55.3″ (from south).]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Jumpoff (from south)	2 37 17.00	182 36 16.00	4.63361	26.728
King (from south)	20 53 38.00	200 45 40.00	4.63511	26.820
Shelly (from south)	56 05 55.00	235 39 04.00	4.79501	38.758
E and W (from north)	160 14 59.00	340 00 23.00	4.90979	50.482
Horse Prairie (from north)	176 22 53.00	356 20 34.00	4.83811	42.802

DICKEY PEAK, CUSTER COUNTY, IDAHO. (Not occupied.)

The first prominent peak on the main backbone of the Lost River Range, west of the road from Dickey to the Pahsimeroi Valley and about 5 miles north of Dickey post office, Custer County. Station mark: Center of peak.

[Latitude 44° 13′ 47.1″. Longitude 113° 52′ 57.8″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Porphyry	9 45 14	189 42 16	4.52735	20.927
Jerry	43 44 06	223 34 43	4.41529	16.169
Anderson	72 43 24	252 37 45	4.07052	7.309
Spar	92 55 31		4.30913	12.662

DICKEY RED ROOF HOUSE, CUSTER COUNTY, IDAHO. (Not occupied.)

Station mark: Center of Al West's residence at Dickey post office. Bench mark, elevation 6,345 feet, is about 25 feet southeast of house.

[Latitude 44° 08′ 04.8″. Longitude 113° 54′ 12.6″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Porphyry	10 07 14	190 05 08	4.36142	14.280
Jerry	63 13 22	243 04 52	4.26209	11.362
Anderson	126 26 56	306 22 11	4.07573	7.398

E AND W, LEMHI COUNTY, IDAHO.

On the high east-west red, rocky ridge on the Continental Divide about halfway between Lemhi and the Pittsburgh & Gilmore Railroad passes on the divide. About 0.5 mile south of the 1 A. P. of 417 M. State boundary between Idaho and Montana. Easily reached from Lemhi River on the west by going up Eighteen Mile Creek or from Nip and Tuck Creek, a tributary of Horse Prairie Creek on the east.

Station mark: A chiseled cross on rock set under a large monument.

Reference mark: Chiseled cross on perpendicular rock by small rock pile.

[Latitude 44° 49′ 45.49″. Longitude 113° 25′ 44.52″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Junction	9 09 55.00	189 06 56.00	4.54822	21.957
Sal	122 34 36.24	302 17 06.05	4.5870729	24.012
Goldstone	160 20 44.60	340 14 32.08	4.5346485	21.281
Bloody Dick	193 07 20.50	13 11 52.61	4.5685499	23.009
J. C. B	224 52 15.02	44 59 40.97	4.2929420	12.198
Brenner	237 56 30.78	58 08 03.10	4.4043716	15.766
Horse Prairie	288 14 02.86	108 26 24.12	4.3867031	15.137
Pass	307 36 45.20	127 45 35.14	4.32030	12.991
Eighteen Mile Peak	320 48 07.00	141 06 23.00	4.73712	33.921
Thumb	340 00 23.00	160 14 59.00	4.90979	50.482
Finger	344 01 18.00	164 11 14.00	4.83559	42.554
Leodare Hill	351 34 11 86	171 36 18.12	4.43143	16.780
Timber Creek	357 02 27.73	177 03 28.56	4.56864	23.014
Ghost	358 56 03.00	178 56 15.00	4.29612	12.288

EAST BUTTE, BINGHAM COUNTY, IDAHO.

On the highest point of the east butte of the Twin Buttes north of Taber post office on the Mackay branch of the Oregon Short Line Railroad. Horses may be taken to the station from the east side. Nearest water is at William Dalzer's ranch, 7 miles southwest.

Station mark: Aluminum bench mark tablet set in solid rock under center of a 7-foot monument.

Reference mark: (1) A chiseled cross on solid rock 7.6 feet a little south of west; (2) a chiseled cross on solid rock 7.53 feet a little south of east.

[Latitude 43° 29′ 51.94″. Longitude 112° 39′ 50.44″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Big Butte	68 53 34.45	248 38 48.63	4.4923903	19.308
Middle Butte	82 57 07.23	262 54 04.94	3.7778843	3.726
Arco	110 20 22.05	289 54 05.70	4.7374676	33.948
Jumpoff	128 50 00.28	308 31 41.33	4.6603249	28.423
Saddle	154 34 34	334 22 37	4.73392	33.673

EIGHTEEN MILE PEAK, LEMHI COUNTY, IDAHO. (Not occupied.)

The northern of two peaks on the east side of the low pass separating the Lemhi Valley from Birch Creek valley, Little Lost River drainage, about 18 miles southeast of Leadore, Idaho. The peak is very prominent and is visible the entire length of the Lemhi River. No monument.

[Latitude 44° 26′ 51.96″. Longitude 112° 59′ 44.18″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Timber Creek	99 34 20.00	279 17 08.00	4.51879	20.518
E and W	141 06 23.00	320 48 07.00	4.73712	33.921

ELEVEN MILES, CUSTER COUNTY, IDAHO.

On the highest point of a black-rock knob at the north end of a timbered ridge between Eleven Mile Creek and the west head of McCay Creek. On the south side of the Yankee Fork of Salmon River. About 11 miles east of Custer and 13 miles east of Bonanza. About 5 miles west of the summit where the old Custer-Challis wagon road crosses the divide between the Yankee Fork and Mill Creek. Easily reached from the camping grounds on Eleven Mile Creek.

Station mark: A triangulation tablet in rock set under a large rock monument and tree signal.

Reference mark: A chiseled cross on solid rock 8.05 feet north.

[Latitude 44° 27′ 50.06″. Longitude 114° 33′ 14.09″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Mount Eustes	80 58 09.89	260 51 34.04	4.1022616	7.863
Ram	302 27 23.58	122 36 13.96	4.2985382	12.356

EUSTES MOUNTAIN, CUSTER COUNTY, IDAHO.

On a sharp, red, rocky peak, known as Mount Eustes, on a ridge between Jordan and Eight Mile creeks, tributaries of the Yankee Fork of Salmon River. One mile south of the wagon-road crossing of the main divide between the head of Jordan and

Mayfield creeks. One mile east and visible from the Sunbeam Mill. The Montana Boy and McFadden mines are located on the peak a short distance from the top. Wagon roads and trails are all over and around the peak. Easily reached from the Sunbeam Mill.

Station mark: A triangulation tablet in rock set under a large monument, which is also a mineral monument.

Reference mark: A chiseled cross on rock set 18.8 feet northwest.

[Latitude 44° 26′ 45.32″. Longitude 114° 42′ 39.31″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Twin	228 36 21.49	48 46 15.16	4.3960898	15.469
Summit Rock	252 34 07.22	72 43 08.02	4.2522856	11.108
Eleven Miles	260 51 34.04	80 58 09.89	4.1022616	7.863
Ram	286 24 48.82	106 40 14.63	4.4848503	18.976
Bonanza	350 34 53.29	170 35 44.78	3.9981961	6.188

FORNEY, LEMHI COUNTY, IDAHO.

On a bald ridge between Mayer and Panther creeks. About 2 miles east of the Cabin Creek ranger station and 4 miles southwest of Forney post office. Station is easily reached by going up any of the grassy ridges from the ranger station.

Station mark: A bronze tablet cemented into solid rock under a rock monument and tree signal.

Reference mark: A chiseled cross on solid rock 12.60 feet south.

[Latitude 44° 57′ 08.23″. Longitude 114° 19′ 58.73″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Black Mountain	3 53 02.83	183 52 35.93	4.0918756	7.678
Taylor	308 30 23.75	128 35 22.98	4.0749643	7.384

FREEDOM, BLAINE COUNTY, IDAHO.

On a prominent, round, rocky, partly grassed hill on divide between Trail and West Fork of Fish creeks. About 0.25 mile north of point where wagon road from Muldoon Creek to Fish Creek crosses the divide. Five miles west and a little north of Crooks post office and a schoolhouse on Fish Creek, 3 miles northwest of Ward's ranch and a schoolhouse on West Fork of Fish Creek, 20 miles north of Carey post office, the nearest store.

Station mark: A small chiseled cross on perpendicular rock centered under a large monument.

Reference mark: Aluminum bench mark tablet set in solid flat rock 11.7 feet north.

[Latitude 43° 30′ 20.3″. Longitude 113° 51′ 17.4″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Buzz	36 12 49	216 08 38	4.14758	8.728
Scorpion	170 17 01	350 15 47	4.15609	8.901
Blizzard	272 46 33	92 54 16	4.18023	9.410
Crooks	333 21 16	153 23 52	4.05567	7.064

GARFIELD, BLAINE COUNTY, IDAHO. (Not occupied.)

On a black-rock knob on divide at west head of Garfield Creek. About 5 miles northwest of junction of Garfield and Muldoon creeks.

Station mark: Tallest monument.

[Latitude 43° 36′ 12.3″. Longitude 113° 58′ 54.5″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Scorpion	247 23 00	67 27 01	3.92839	5.269
Blizzard	294 29 08	114 42 07	4.44566	17.338
Freedom	316 35 28	000 00 00	4.17442	9.285

GARFIELD MOUNTAIN, IDAHO-MONTANA. (Not occupied.)

Center of a big round rocky peak named Garfield Mountain on Continental Divide, 20 miles west of Monida, Idaho. No monument.

[Latitude 44° 31′ 15.08″. Longitude 112° 37′ 12.47″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Timber Creek	87 47 12.00	267 14 12.00	4.79568	38.818
Horse Prairie	123 10 21.00	302 48 34.00	4.68907	30.368

GHOST, LEMHI COUNTY, IDAHO.

On a low isolated hill on the south side of Lemhi Valley and the west side of Timber Creek. About 6 miles southwest and visible from Leadore, Idaho. Easily reached from the ranch roads up the west side of Timber Creek.

Station mark: A chiseled cross under a large monument.

Reference mark: A chiseled cross on rock 14.20 feet east.

[Latitude 44° 39′ 04.98″. Longitude 113° 25′ 27.84″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
E and W	178 56 15.00	358 56 03.00	4.29612	12.288
Horse Prairie	241 55 16.00	62 07 24.00	4.41176	16.037

GOLDSTONE, LEMHI COUNTY, IDAHO.

On the last south high rocky peak on the Continental Divide Range. About 1,000 feet southwest of State-line boundary post 3 A. P. 468 M. On the headwaters of Kenny Creek, about 2 miles south of Goldstone mine on Pratt Creek. A good trail comes up Pratt Creek from Salmon River, and a wagon road comes into the mine from the Montana side. The station is easily reached by trail from the mine or by coming up the ridges from the ranches on Kenny Creek.

Station mark: A triangulation tablet cemented in a rock set under large monument.

Reference mark: A chiseled cross on solid rock 12.90 feet south.

[Latitude 45° 07′ 10.00″. Longitude 113° 34′ 31.58″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Sal	61 21 09.08	241 09 49.35	4.3794112	14.885
Mill	71 32 15.00	251 22 51.00	4.26426	11.419
Baldy	94 59 45.10	274 41 20.59	4.5337146	21.236
Graveyard	100 27 52.00	280 15 19.00	4.37301	14.668
E and W	340 14 32.08	160 20 44.60	4.5346485	21.281

GRAVEYARD, LEMHI COUNTY, IDAHO.

On a low hill, the first or north hill on the divide between the forks of Lemhi and Salmon rivers. About 0.5 mile southeast of Salmon City. The cemetery is at the west foot of the hill.

Station mark: A triangulation tablet set in solid rock under a rock monument.

Reference mark: A chiseled cross on a big flat rock northwest of station.

[Latitude 45° 09′ 27.51″. Longitude 113° 52′ 14.31″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Goldstone	280 15 19.00	100 27 52.00	4.37301	14.668
Sal	351 53 18.00	171 54 31.00	4.20204	9.895

GROUSE, CUSTER COUNTY, IDAHO.

On a grassy hill on the main divide between Salmon and Pahsimeroi rivers. It is the beginning of the Little Lost River Mountain Range. About 10 miles northwest of Challis and the same distance southwest of May. The trail from Jack Adams's ranch on Salmon River up Dodge Gulch to the Pahsimeroi Valley crosses the ridge one-quarter of a mile north of hill. Good spring and grass at the head of Dodge Gulch. Challis and May are both visible.

Station mark: Triangulation tablet set in solid rock under large rock monument.

Reference mark: A chiseled cross on solid rock 16.8 feet east.

[Latitude 44° 33′ 56.96.″ Longitude 114° 05′ 38.93″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Spar	5 26 59.76	185 25 10.46	4.5622512	22.678
Lone Pine	13 47 01.00	193 43 51.00	4.40146	15.661
Redwings	20 54 54.96	200 43 47.67	4.7748586	37.001
Ram	42 06 03.33	221 55 34.76	4.4718106	18.415
Bay Horse	53 22 08.00	233 11 05.00	4.41569	16.182
Challis	68 03 49.00	247 56 43.00	4.16020	8.986
Twin	95 59 35.22	275 43 31.01	4.4838014	18.930
Taylor	164 56 00.42	344 50 53.59	4.5660021	22.875
Baldy	185 58 56.13	6 02 34.04	4.8113331	40.243
Sal	201 39 16.65	21 49 55.82	4.7310495	33.450
Lem	217 03 02	37 12 40	4.47729	18.650
Hi Peak	236 58 12	57 09 16	4.39484	15.424
Pahsimeroi	284 09 06	104 33 05	4.67001	29.064

HADES, BLAINE COUNTY, IDAHO.

On an old crater partly grassed, which from a distance appears as a round hill. It is the last big crater at the southeast end of the chain of craters that extend out in the Lavas from the point of the high divide between Lava and Cottonwood creeks. About 16 miles southeast of Martins post office and ranch, the outfitting point. Eight miles southeast of the Bear Trap at the end of the road where all the craters of a comparative recent age are clustered. From Martin's ranch follow the Arco-Hailey road south about 3 miles and take the first left-hand road, built by Mr. Martin as a wood road, now used by autos for sight-seeing. A short distance beyond the Bear Trap and near the end of the road on the south slope of a black cinder crater a small monument on the edge of lava wall marks the beginning of the trail. For the first mile this trail is across the new lavas and is very rough, but well marked by small rock piles. The route then is southeast, leaving the big red-topped partly timbered (Aspen tree) crater to the right or west and the horseshoe crater to the left or north. About 1 mile southeast of the horseshoe crater a big monument and a lone pine tree mark the only

water, which is an ice cave in the crevice of the lavas. Grass sufficient for horses about a mile farther on the next two craters. The station is visible and about 4 miles southeast from water hole.

Station mark: A triangulation tablet set in placed rock centered under a large monument.

Reference mark: Chiseled cross on placed rock 11.2 feet northwest.

[Latitude 43° 21′ 06.28″. Longitude 113° 27′ 59.68″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Buzz	98 24 56	278 04 55	4.60395	24.963
Crooks	104 51 30	284 37 36	4.43546	16.936
Blizzard	135 09 27.23	315 01 09.21	4.3632852	14.343
Crawford	179 19 28.94	359 19 13.96	4.6164004	25.689
Arco	201 04 49.13	21 11 44.08	4.5745275	23.328
Big Butte	261 59 47.29	82 18 06.88	4.5609470	22.610

HERD, CUSTER COUNTY, IDAHO.

On a high grassy knob on the main divide between Big Lost River and East Fork of Salmon River. Near the head of the left-hand fork of Herd Creek. About 10 miles southeast of Stevens ranch on Herd Creek. Seven miles northwest of the mouth of East Fork of Big Lost River. Fifteen miles southwest of Chilly. Easily reached from Herd Creek or Big Lost River.

Station mark: A chiseled cross on solid rock under a large monument.

Reference mark: A chiseled cross on solid rock 8 feet north.

[Latitude 43° 59′ 11.63″. Longitude 114° 13′ 30.64″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Redwings	129 00 40.12	308 55 04.13	4.14135	8.604
Jerry	229 03 00.59	49 07 55.71	4.09741	7.777

HI PEAK, LEMHI COUNTY, IDAHO. (Not occupied.)

On the highest peak in the Lemhi Range between the Hayden Basin and Pahsimeroi Valley. Ten miles north of May, Idaho.

Station mark: Center of big monument.

[Latitude 44° 41′ 14.22″. Longitude 113° 49′ 53.89″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Grouse	57 09 15.55	236 58 11.65	4.39484	15.424
Sal	178 42 04.48	358 41 37.82	4.56247	22.689

HORSE PRAIRIE, LEMHI COUNTY, IDAHO-BEAVERHEAD COUNTY, MONT.

About 20 miles northeast of Junction and Leadore, Idaho, on a high hill at the head of East Fork of Canyon Creek on the Continental Divide boundary line between Montana and Idaho. Near Montana–Idaho State boundary post 537.12 M. Good wagon road to Crukshank's ranch on Canyon Creek, then a long gradual climb up ridge between two forks of creek about 1 mile east of ranch. The monument is visible the entire length of the creek.

Station mark: A chiseled cross on solid rock under a large monument.

Reference mark: The iron State boundary post marked 537.12, 52.40 feet south.

[Latitude 44° 45′ 37.20″. Longitude 113° 08′ 12.48″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Finger	4 24 58.00	184 22 36.00	4.76622	36.272
Timber Creek	36 03 58.00	215 52 40.00	4.55911	22.514
Pahsimeroi	42 56 40.00	222 40 21.00	4.65580	28.129
Junction	46 44 37.00	226 29 19.00	4.59806	24.627
Leadore Hill	45 20 24.12	225 10 11.00	4.43234	16.815
Ghost	62 07 24.00	241 55 16.00	4.41176	16.037
E and W	108 26 24.12	288 14 02.86	4.3867031	15.137
Bloody Dick	161 34 17.52	341 26 26.09	4.6637226	28.647
Garfield Mountain	302 48 34.00	123 10 21.00	4.68907	30.368
Thumb	356 20 34.00	176 22 53.00	4.83811	42.802

HOWE, BLAINE COUNTY, IDAHO.

On the high grassy ridge between Argo Pass and the Lavas. About 16 miles northeast of Arco and 6 miles southwest of Howe Post Office. Spring on the wagon road on the north slope of Argo Pass is the nearest water. Best route is up the long canyon on the south side of the Pass.

Station mark: Bench mark tablet set in solid rock over which a big monument is centered.

Reference mark: A chiseled cross on solid rock 8.48 feet southeast.

[Latitude 43° 42′ 48.5″. Longitude 113° 05′ 57.2″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Arco	72 16 38	252 08 21	4.22866	10.520
King	117 24 26	297 17 13	4.19810	9.804
Jumpoff	172 50 02	352 49 44	3.66814	2.894

INFERNO, BLAINE COUNTY, IDAHO.

On the highest point of a dome-shaped black cinder crater near the "Bear Trap" at the end of the wagon road. Eight miles southeast of Martin post office and ranch the nearest water. The crater 0.25 mile northwest is a few feet higher and has grass and scattering trees on northwest slope. The crater is easily recognized from the trimmed double tree that will appear as a single tree from an easterly or westerly direction. Wagon and automobile can be taken almost to the top.

Station mark: A 10-inch old drill driven in red solid cinder on top of the black cinder.

Reference mark: The base of the eastern of two trimmed trees slightly on the east slope of the crater 149 feet southeast.

[Latitude 43° 26′ 37.1″. Longitude 113° 33′ 03.2″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Blizzard	122 58 31	302 53 20	4.05228	7.009
Crawford	191 27 01	11 30 15	4.50194	19.736
Arco	219 15 52	39 26 16	4.50622	19.933

INVISIBLE, CUSTER COUNTY, IDAHO. (Not occupied.)

On the highest point of a big ridge-shaped mountain at the south end of the high mountains of the Lost River Range just north of the head of Pass Creek. Seven miles northeast and visible from Mackay and about 5 miles west of Pass Creek ranger station.

Can only be reached from the south or Mackay side and is very rough and steep. Horses can be taken to the top in six hours by picking a route amongst the big bowlders.

Station mark: Chiseled cross on placed rock centered under a large monument.

Reference mark: A hole drilled for tablet in solid rock 16 feet south.

[Latitude 43° 58′ 00.5″. Longitude 113° 30′ 51.6″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Shelly	47 37 18	227 28 04	4.36208	14.303
Mackay	60 11 53	240 04 10	4.23476	10.670
Crawford	352 54 16	172 56 00	4.43462	16.904

JERRY, CUSTER COUNTY, IDAHO.

On the highest grassy hill on the main divide between the waters of East Fork of Salmon River and Big Lost River. At the heads of Lake Creek, a tributary of Herd Creek, Salmon River, and Rogers Canyon, Lost River. Three miles east of Stevens Lake and 8 miles east of Stevens ranch on Herd Creek, 5 miles southwest of Peterson's ranch at the mouth of Rogers Canyon, 12 miles west and visible from Chilly post office. Easiest reached from Stevens Lake and Peterson's ranch. At 900 feet, by steppings southwest is iron section corner post marked "C. C. T. 9 N., sec. 33, secs. 4 and 5, T. 8 N., R. 20 E." About 90 feet north of iron post is section-corner stone marked with four scratches on east. In sighting the iron-post section corner the sight also passes over quarter section corner, small iron post, between secs. 5 and 6.

Station mark: A chiseled cross on solid rock over which a monument is centered.

Reference marks: (1) A chiseled cross on solid rock 8.85 feet south; (2) iron post, about 900 feet; true azimuth 64° 02′ 25″.

[Latitude 44° 03′ 37.16″ (from north); 44° 03′ 37.25″ (from south). Longitude 114° 06′ 25.97″ (from north); 114° 06′ 25.97″ (from south).]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Herd (from north)	49 07 56	229 03 01	4.09741	7.777
Potaman (from north)	127 47 51.74	307 35 47.70	4.4654485	18.147
Ram (from north)	151 09 05.94	330 59 12.98	4.5912949	24.246
Ram (from south)	151 09 01.75	.....	4.5913160	24.247
Spar (from south)	173 02 17.66	.....	4.3006728	12.417
Anderson (from south)	203 38 30.38	23 42 00.73	4.2234690	10.395
Mackay (from south)	299 56 45.29	120 13 43.85	4.5773607	23.481
Porphyry (from south)	319 21 57.32	139 28 20.99	4.2769062	11.756
Redwings (from south)	91 31 54.11	271 21 22.57	4.3057368	12.563

JUMPOFF, BLAINE COUNTY, IDAHO.

On the highest of several grassy hills on the ridges between Argo Pass and the Lavas. Ten miles a little north of east of Arco City and about 4 miles west of Howe post office. Water and feed at Howe post office and the spring on the north side of Argo Pass. Can be reached with horses from either east or west side.

Station mark: Aluminum bench-mark tablet set in solid rock over which a large monument is centered.

Reference mark: A chiseled cross on solid rock 5.7 feet north.

[Latitude 43° 45′ 18.27″. Longitude 113° 06′ 23.20″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Arco	57 49 54.50	237 41 55.08	4.2639317	11.410
King	101 07 43.68	281 00 48.37	4.1362120	8.503
Bell	172 37 15	352 33 38	4.73201	33.524
Diamond	182 36 16	2 37 17	4.63361	26.728
Saddle	211 06 21	31 12 42	4.37533	14.746
East Butte	308 31 41.33	128 50 00.28	4.6603249	28.423
Middle Butte	314 26 25.89	134 41 42.04	4.6210830	25.968
Big Butte	350 14 06.88	170 17 36.87	4.6066291	25.118
Howe	352 49 44	172 50 02	3.66814	2.894

JUNCTION, LEMHI COUNTY, IDAHO.

On a mountain in the Lemhi Range on the west side of Timber Creek and near its head. About 15 miles southwest of Leadore, Idaho. About 1 mile east of a very prominent yellow peak. Easily reached from the Timber Creek trail.

Station mark: A chiseled cross under a large monument.

Reference mark: A chiseled cross 12.55 feet north.

[Latitude 44° 30′ 55.26″. Longitude 113° 29′ 59.37″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
E and W	189 06 56.00	9 09 55.00	4.54822	21.957
Horse Prairie	226 29 19.00	46 44 37.00	4.59806	24.627

KING, BLAINE COUNTY, IDAHO.

On the northern of two high peaks on King Mountain between Big Lost and Little Lost rivers, about 8 miles due north of Arco City, 25 miles southeast and visible from Mackay City. Can only be reached with horses from the east side by leaving wagon road near Argo Pass.

Station mark: A triangulation tablet set in placed rock centered under a large monument.

Reference marks: (1) A chiseled cross on solid rock 52.4 feet north; (2) a chiseled cross on solid rock 16.15 feet east.

[Latitude 43° 46′ 43.41″. Longitude 113° 16′ 23.60″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Arco	9 33 35.10	189 32 30.56	4.1002561	7.827
Crawford	69 16 28.82	249 08 12.41	4.2350095	10.675
Shelly	98 31 23.38	278 12 36.14	4.5657993	22.864
Mackay	109 56 29.76	289 38 46.36	4.5618031	22 654
Sunset	160 40 35	340 36 35	4.36698	14.467
Bell	187 09 51	7 13 11	4.70993	31.863
Diamond	200 45 40	20 53 38	4.63511	26.821
Saddle	235 20 53	55 34 10	4.49390	19.375
Jumpoff	281 00 48.37	101 07 43.68	4.1362120	8.503
Howe	297 17 13	177 24 26	4.19810	9.804

KLUG, CUSTER COUNTY, IDAHO.

On a high timbered hill on the divide between Johns Gulch and Birch Creek. About 5 miles southwest and in view of Challis. Three miles south of Alexander Klug's ranch on Gordon Creek at the mouth of Johns Creek, 2 miles west of Challis. Good route up Johns Creek to station. The point commands a good view of the whole of Challis Valley.

Station mark: A chiseled cross on a large rock under monument and tree signal.

Reference mark: A chiseled cross on solid rock 18.10 feet east.

[Latitude 44° 27′ 41.78″. Longitude 114° 16′ 21.61″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Twin	132 22 38.00	312 14 05.00	4.33897	13.562
Grouse	230 43 43.00	50 51 13.00	4.26291	11.383

LEADORE HILL, LEMHI COUNTY, IDAHO.

On the highest point of a rocky-topped timbered low hill on the west side of Timber Creek. About 5 miles south and visible from Leadore City. There is a large warm spring at the northeast foot of the hill.

Station mark: A triangulation tablet cemented in solid rock.

Reference mark: A chiseled cross on solid rock 11.5 feet south.

[Latitude 44° 35′ 20.07″. Longitude 113° 22′ 45.06″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
E and W	171 36 18.12	351 34 11.86	4.43143	16.780
Horse Prairie	225 10 10.61	45 20 24.12	4.43234	16.815

LEATHERMAN, CUSTER COUNTY, IDAHO. (Not occupied.)

The first high peak on main backbone of the Lost River Range east of Leatherman Pass about 7 miles east of Chilly and 20 miles a little west of north from Mackay City.

Station mark: Summit of peak.

[Latitude 44° 04′ 57.0″. Longitude 113° 43′ 56.3″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Porphyry	46 37 14	226 28 00	4.38862	15.204
Jerry	85 26 48	265 11 09	4.47907	18.732
Mackay	353 05 25	173 07 00	4.33366	13.397

LEM, LEMHI COUNTY, IDAHO. (Not occupied.)

On a high peak in the Lemhi Range near the head of Poison Creek, west of Hayden basin.

Station mark: Center of big monument.

[Latitude 44° 46′ 52.20″. Longitude 113° 51′ 56.36″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Grouse	37 12 40.00	217 03 01.65	4.47729	18.651
Sal	184 04 00.06	4 04 59.82	4.41728	16.242

LONE PINE, CUSTER COUNTY, IDAHO. (Not occupied.)

On the highest point of the big prominent lone peak on the east side of Salmon River, about 10 miles southeast of Challis. The peak is known to the old settlers as Lone Pine and is visible from Challis and the whole valley.

Station mark: Center of big monument.

[Latitude 44° 20′ 43.87″. Longitude 114° 10′ 10.02″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Twin	138 39 11.00	318 26 18.00	4.56600	22.874
Grouse	193 43 51.00	13 47 01.00	4.40146	15.661

LOW, LEMHI COUNTY, IDAHO. (Not occupied.)

On the only low rock hill in that vicinity, about 10 or 12 miles northeast of Forney. The hill is known to some as Swan Peak.

Station mark: Center of monument.

[Latitude 45° 00′ 53.85″. Longitude 114° 11′ 29.18″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Taylor	7 27 52.00	187 26 51.00	4.16115	9.005
Red Rock	85 23 07.00	265 13 02.00	4.27401	11.678

McCALEB, CUSTER COUNTY, IDAHO. (Not occupied.)

On Mount McCaleb, a prominent locally known peak on end of ridge about 1 mile south of main backbone of the Lost River Range. About 3 miles north of and visible from Mackay.

Station mark: Small monument.

[Latitude 43° 59′ 32.8″. Longitude 113° 35′ 48.1″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Mackay	36 00 22	215 56 05	4.14877	8.751
Porphyry	76 43 31	256 29 16	4.46927	18.307
Jerry	100 37 08	280 16 23	4.61931	25.862
Crawford	341 28 37	161 33 46	4.49784	19.553

McGOWAN, CUSTER COUNTY, IDAHO.

On the north end of the only rock ridge between the two main forks of Basin Creek and about half a mile south of the divide between Basin Creek and the West Fork of the Yankee Fork, about 8 miles west of Bonanza and 12 miles northeast of Stanley basin. The old hay trail from Stanley basin to Custer via Bonanza passes along the east and south foot of the ridge.

Station mark: The center of a rock monument.

Reference mark: A chiseled cross on solid rock several inches below surface under a small rock pile 6.60 feet north. This is the point occupied by instrument.

[Latitude 44° 20′ 27.37″. Longitude 114° 50′ 35.12″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Trap	216 54 30.57	37 02 58.71	4.4262530	16.581
Ram	265 33 38.25	85 54 35.84	4.6015083	24.823

McGUIRE, LEMHI COUNTY, IDAHO. (Not occupied.)

On the highest of the very rough peaks, sometimes called the "Big Horn Crags," 12 miles southeast of the junction of the Middle Fork of Salmon River with the main Salmon River, about 15 miles southwest of Shoup, Idaho. The divide trail from the Forney-Yellow Jacket road at Red Rock passes down Clear Creek 6 miles east of station. Peak very difficult to reach.

Station mark: Center of big monument.

[Latitude 45° 10′ 29.26″. Longitude 114° 36′ 04.73″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Middle Fork	10 07 39.94	190 05 23.91	4.37922	14.879
Baldy	273 47 50.14	94 13 03.84	4.66968	29.042

MACKAY, CUSTER COUNTY, IDAHO.

On the northeast rocky knob of the north peak above the Mackay mine. About 4 miles south and visible from Mackay City. Easily reached with animals from Mackay by taking the main road to Mackay mine and following all left-hand roads which run in the creek bottom. At the end of the road go up a snow slide on the north side of peak. About a 3-hour ride from Mackay.

Station mark: A tablet set in solid rock over which a large monument is centered.

Reference mark: A chiseled cross on solid rock 16.4 feet northeast.

[Latitude 43° 53′ 23.45″. Longitude 113° 41′ 59.04″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Shelly	16 34 18.94	196 33 14.42	3.8630279	4.533
Porphyry	102 43 28.08	282 32 53.79	4.3204384	12.995
Anderson	142 59 35.09	322 46 05.29	4.6331939	26.702
McCaleb	215 56 05	36 00 22	4.14877	8.752
Invisible	240 04 10	60 11 53	4.23476	10.669
King	289 38 46.36	109 56 29.76	4.5618031	22.654
Crawford	315 11 14.08	135 20 40.04	4.4143959	16.134

MARTIN, BLAINE COUNTY, IDAHO. (From two stations only; no check on this position.)

On a round partly grassed lava hill at northeast foot of grassy divide, 0.25 mile southeast and visible from Martin's ranch and post office. The Arco-Hailey wagon road passes along the northeast foot of the hill.

Station mark: Aluminum bench mark tablet under center of monument.

Reference marks: (1) Cross on flat lava rock 35.7 feet east; (2) corner of secs. 11, 12, 13, and 14, T. 2 N., R. 24 E., is 1,500 feet distant; true azimuth 289° 10′ 08″.

[Latitude 43° 30′ 41.0″. Longitude 113° 33′ 35.0″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Blizzard	81 00 13	260 55 45	3.94707	5.501
Arco	230 31 06	50 41 53	4.43503	16.919

MIDDLE BUTTE, BINGHAM COUNTY, IDAHO.

United States Coast and Geodetic Survey station on the highest part near north end of Middle Butte, which is the west butte of Twin Buttes. This butte is located on north side of the Mackay Branch of the Oregon Short Line Railroad. Can be

reached from either the wells at Tabor post office and railroad station, 15 miles southeast, or Delzers Bros. deep well and ranch, 5 miles southwest. Horses may be taken one-third way up by ascending from north side.

Station mark: A bronze tablet set by the United States Coast and Geodetic Survey.

Reference marks: (1) A bronze reference tablet set by the United States Coast and Geodetic Survey 13.7 feet west; (2) a Geological Survey bench mark tablet set in solid rock under center of large monument 9 feet north.

[Latitude 43° 29′ 28.01″. Longitude 112° 44′ 15.28″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Big Butte	65 32 29.48	245 20 45.83	4.4030997	15.720
Arco	113 29 25.57	293 06 11.91	4.6936166	30.688
Jumpoff	134 41 42.04	314 26 25.89	4.6210830	25.968
East Butte	262 54 04.94	82 57 07.23	3.7778843	3.726

MIDDLE FORK, LEMHI COUNTY, IDAHO.

A big rock knob on a timbered hill on main divide at the head of Warm Springs Creek to the west and Camp Creek to the east. About 12 miles west of Yellow Jacket and 5 miles east of the Mormon ranch on Middle Fork of Salmon River, 6 miles northeast of the junction of the Yellow Jacket and Camas creeks. The trail from Yellow Jacket to the Mormon ranch crosses the divide about a mile to the south.

Station mark: A triangulation tablet under a monument.

Reference mark: A chiseled cross on solid rock 7.9 feet south.

[Latitude 44° 57′ 45.62″. Longitude 114° 39′ 16.85″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Sleeping Deer	7 26 00.69	187 24 30.01	4.3394058	13.576
Bee Hive	195 53 33.85	15 57 59.73	4.4758179	18.586
Quartzite	236 24 34.00	56 33 25.00	4.29496	12.254
Baldy	248 01 38.91	68 29 05.84	4.7389049	34.061
Red Rock	256 25 33.07	76 35 07.33	4.2625318	11.373
Taylor	283 42 18.83	104 00 55.98	4.5530660	22.203
Black Mountain	298 38 30.60	118 51 41.22	4.4475912	17.416

M. P. 12, LEMHI COUNTY, IDAHO.

On the northeast end of a burnt flat hill with scattering young pine. On the main divide between the waters of Middle Fork of Salmon and Salmon River. Deer Creek to the north and Yellow Jacket Creek to the south. Milepost 12 on the divide trail from the Forney-Yellow Jacket road crossing the main divide to Clear Creek via Red Rock and Cathedral is on the east slope of the hill about one-fourth mile from station. The station commands a good view but was not placed on the highest point of the flat top because it required too much cutting to sight the different points.

Station mark: A chiseled cross on rock set under a rock monument.

Reference mark: A triangulation tablet in solid rock 6.93 feet south.

[Latitude 45° 05′ 44.50″. Longitude 114° 30′ 30.27″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Baldy	261 49 50.00	82 11 06.00	4.59916	24.689
Red Rock	329 13 21.00	149 16 43.00	4.08747	7.600

MILL, LEMHI COUNTY, IDAHO.

On a low grassy hill south of Mill Creek about 10 miles southeast of Salmon City and 4 miles west of Baker post office on Lemhi River. Easily reached from Salmon by the Warm Springs road past the graveyard or from the Lemhi River. On the divide between Mulkey and Withington creeks.

Station mark: A triangulation tablet cemented into a large bowlder.

Reference mark: A chiseled cross on rock 36 feet south.

[Latitude 45° 04′ 00.70″. Longitude 113° 47′ 48.37″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Baldy	117 43 25.00	297 35 26.00	4.27413	11.681
Goldstone	251 22 51.00	71 32 15.00	4.26426	11.419

PAHSIMEROI, LEMHI COUNTY, IDAHO.

On a high rocky peak—main divide Lemhi Range—at the head of Timber Creek, a tributary of Lemhi River to the north, a tributary of Little Lost River to the east, and a tributary of the Pahsimeroi River to the west. The trail up Timber Creek leads to foot of hill but from here to top of peak is a long rocky climb. The hill on the divide half a mile northwest is the highest.

Station mark: A chiseled cross on solid rock under a rock monument.

Reference mark: A chiseled cross on solid rock.

[Latitude 44° 27′ 41.29 ″. Longitude 113° 31′ 27.61″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Ram	81 12 30	260 38 06	4.82002	41.055
Grouse	104 33 05	284 09 06	4.67001	29.064
E and W	190 26 49.00	10 30 50.00	4.61876	25.829
Horse Prairie	222 40 21.00	42 56 40.00	4.65580	28.129

PASS, LEMHI COUNTY, IDAHO.

On a high grassy hill about 10 miles northeast and visible from Leadore, Idaho. Best reached by following wagon road up Canyon Creek to the forks at first ranch, below creek water tank G. & P. Railroad, thence one-half mile up the east fork of Canyon Creek before going up the long grassy ridge to the south.

Station mark: Chiseled cross on slanting solid limestone under a large monument.

Reference mark: Triangulation tablet set in solid rock 13.90 feet south.

[Latitude 44° 42′ 51.44″. Longitude 113° 13′ 12.07″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
E and W	127 45 35.14	307 36 45.20	4.32030	12.991
J. C. B	174 20 29.44	354 19 04.41	4.42829	16.659

PION, CUSTER-BLAINE COUNTY LINE, IDAHO. (Not occupied.)

On the west of the last two big dome-shaped mountains on the divide between Antelope and Muldoon creeks about 15 miles northwest of Grouse post office and 3 miles east of the pass through which the trail goes from East Fork of Big Lost River basin to Muldoon Creek.

Station mark: Small monument.

POLITECHNIKA GDAŃSKA ZAKŁAD GEOLOGII

[Latitude 43° 37′ 31.4″. Longitude 113° 50′ 36.0″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Scorpion	103 37 56	283 36 20	3.53644	2.137
Smiley	198 21 06	18 22 31	3.94039	5.417
Blizzard	314 41 02	134 48 17	4.30030	12.408

PORPHYRY, CUSTER COUNTY, IDAHO.

On a reddish rocky dome-shaped hill on grassy ridge ½ mile south of main divide between East Fork of Lost River and Big Lost River. About 12 miles south and visible from Chilly post office. About 4 miles east of Johnson ranch on the East Fork. The hill is very prominent and can be seen from the entire Copper Basin valley and from the Lost River valley in the vicinity of Dickey and Chilly. Good camping ground at head of gulches near station.

Station mark: A tablet set in placed rock centered under large monument.

Reference mark: A chiseled cross on solid rock 11.2 feet north.

[Latitude 43° 55′ 51.69″. Longitude 113° 57′ 13.62″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Redwings	114 42 44.00	294 25 49.51	4.5536465	22.233
Jerry	139 28 20.99	319 21 57.32	4.2769062	11.756
Anderson	169 23 59.89	349 21 05.85	4.4801275	18.771
Dickey Peak	189 42 16	09 45 14	4.52735	20.927
Dickey red roofed house	190 05 08	10 07 14	4.36142	14.28
Beauty	211 06 44	31 13 58	4.42918	16.69
Leatherman	226 28 00	46 37 14	4.38862	15.20
Mackay	282 32 53.79	102 43 28.08	4.3204384	12.995
Shelly	302 09 45.42	122 19 14.81	4.3361139	13.473
Copper Basin ranger station	324 55 21	145 00 19	4.22285	10.380
Reed & Davis	327 27 06	147 31 16	4.17590	9.316
Smiley	335 35 55.40	155 41 55.53	4.4501498	17.519
Scorpion	350 27 53.26	170 30 45.10	4.5264167	20.882

POTAMAN, CUSTER COUNTY, IDAHO.

On the highest rock knob on the narrow rock ridge on top of the grassy divide between Sullivan and Spud creeks to the north, and Smith Lake Creek to the south and east. Two miles south of Bradshaw's ranch on Spud Creek. This is the only ranch on Spud Creek and is about 1 mile south of Salmon River. Three miles southeast of Clayton post office and mill on Salmon River. It is the highest peak in the vicinity and commands a splendid view.

Station mark: A chiseled cross on a slanting solid rock under a rock monument and tree signal.

Reference mark: A triangulation tablet in solid rock 9.45 feet north.

[Latitude 44° 13′ 15.75″. Longitude 114° 23′ 45.61″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Trap	150 37 40.17	330 27 22.10	4.5996871	24.719
Ram	194 25 41.99	14 27 54.21	4.2259548	10.455
Jerry	307 35 47.70	127 47 51.74	4.4654485	18.147

PROMINENT, CUSTER COUNTY, IDAHO.

On the highest point of Pinyon Mountain on the divide between the waters of Big Loon and Rapid creeks. At the head of Canyon Creek to the east and Difficult Creek to the west. Two miles west of Ivers, Lost Pocket Mine, 6 miles east of Casto,

and 5 miles northwest of Loon Creek Center ranger station. Easily reached by road and trail from Ivers. It is a high large white-rock peak, timbered on west, and very prominent.

Station mark: A triangulation tablet under a large rock monument with tree in center.

Reference mark: A chiseled cross 7.45 feet south; tall flagpole in center of small monument 59.1 feet west.

[Latitude 44° 34′ 12.70″. Longitude 114° 54′ 57.62″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Thompson Peak	18 23 22.00	198 16 27.00	4.62109	25.968
Ramey	188 07 27.00	268 09 38.00	4.46266	18.030
Sleeping Deer	219 06 15.23	39 15 46.25	4.4520672	17.596
Sheldon	242 45 26.00	63 00 24.00	4.50032	19.664
Trap	280 41 47.32	100 53 20.66	4.3464774	13.798
The General	316 34 43.15	136 39 30.63	4.1199010	8.189

PUDDIN, LEMHI COUNTY, IDAHO. (Not occupied.)

On a high rough rock peak about 3 miles south of Mount McGuire. Puddin and Wilson creeks head around the peak. About 15 miles southeast of the junction of the Middle Fork with main Salmon River. Hard to reach but best approached from the east by leaving the divide trail from Forney to Clear Creek near the Cathedral Rock 17-mile post.

Station mark: Center of big monument.

[Latitude 45° 06′ 46.25″. Longitude 114° 37′ 42.05″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Baldy	265 32 16.00	85 58 37.87	4.68941	30.392
Taylor	307 38 14.00	127 55 45.98	4.61501	25.607

QUARTZITE, LEMHI COUNTY, IDAHO.

On a quartz knob and timbered hill on main divide between Middle Fork of Salmon River and Salmon River, Yellow Jacket Creek to west and Musgrove Creek to the east. Between mileposts 6 and 7 on the divide trail from the Forney-Yellow Jacket wagon road crossing the divide to Clear Creek; 14 miles northwest of Forney and 15 miles northeast of Yellow Jacket. Good camping ground 1 mile west, near milepost 8.

Station mark: A chipped place on edge of a sharp quartz bowlder under a small monument and signal.

Reference mark: A chiseled cross on rock 14.35 feet west; also, a blazed tree 8.30 feet northwest.

[Latitude 45° 03′ 38.41″. Longitude 114° 26′ 45.93″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Middle Fork	56 33 25.00	236 24 34.00	4.29496	12.254
Taylor	316 48 28.00	136 58 15.00	4.42558	16.555

RAM, CUSTER COUNTY, IDAHO.

On the highest bald rock peak 2 miles south of Bay Horse. About 5 miles southwest of the junction of Bay Horse Creek and Salmon River. At the head of the first south fork west of Salmon River and first east of Bay Horse City, of Bay Horse Creek. A good log slide up this creek nearly to the top. Best reached from Farren's ranch at the bridge across Salmon River at the mouth of Bay Horse Creek, by following the long ridge on south side of Bay Horse Creek. The peak is very prominent and furnishes a good view in all directions.

Station mark: A chiseled cross on top of long narrow rock buried under monument and tree signal.

Reference mark: A chiseled cross on long narrow rock 9.9 feet north.

[Latitude 44° 22′ 03.62″. Longitude 114° 20′ 36.27″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Potaman	14 27 54.21	194 25 41.99	4.2259548	10.455
Robinson Bar	60 33 47.37	240 17 09.23	4.5616082	22.644
McGowan	85 54 35.84	265 33 38.25	4.6015083	24.823
Bonanza	87 47 01.06	267 32 27.43	4.4423271	17.206
Mount Eustes	106 40 14.63	286 24 48.82	4.4848503	18.976
Eleven Miles	122 36 13.96	302 27 23.58	4.2985382	12.356
Trap	127 49 00.61	307 36 29.14	4.4770013	18.636
Twin	157 19 00.00	337 13 26.23	4.4352802	16.929
Grouse	221 55 34.76	42 06 03.33	4.4718106	18.415
Pahsimeroi	260 38 06	81 12 30	4.82002	41.055
Jerry	330 59 12.98	151 09 05.94	4.5912949	24.246

RAMEY, IDAHO COUNTY, IDAHO.

On a sharp white hill with scattered trees on the divide extending west from the junction of Loon Creek and Middle Fork of Salmon River, about 4 miles west and visible from the barn of R. L. Ramey's ranch at the above junction. The best route is to cross Loon Creek over Ramey's Bridge and follow the old Thunder Mountain trail up Salmon River for a mile or so before fording the Middle Fork, thence up the long grassy ridge to station. Middle Fork can only be forded late in the summer. There is a cable across river at Ramey's, but only for passengers.

Station mark: A chiseled cross on solid rock under a big monument and tree signal.

Reference mark: A chiseled cross on solid rock 14.55 feet east.

[Latitude 44° 49′ 43.27″. Longitude 114° 51′ 50.95″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Trap	231 41 27.00	151 50 51.00	4.57197	23.191
Prominent	268 09 38.00	188 07 27.00	4.46266	18.030

RAY SHEEP, CUSTER COUNTY, IDAHO. (Not occupied.)

On the big prominent rock peak 10 miles west of (Ivers) Lost Pocket Mine. The peak is locally known as Sheep and is reached from the Ivers-Greyhound trail.

Station mark: Center of rock monument.

[Latitude 44° 35′ 58.67″. Longitude 115° 00′ 29.82″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Sleeping Deer	233 20 41.00	53 34 06.00	4.49652	19.492
Trap	284 10 29.00	104 25 56.00	4.47815	18.685

RED ROCK, LEMHI COUNTY, IDAHO.

On a red-rock peak, called Independence Mountain, on divide between Fourth of July and Yellow Jacket creeks. Seven miles west of Forney and 8 miles east of Yellow Jacket. The wagon road joining these two places crosses the divide about 1½ miles south. The trail along the divide north from the road passes over the top of the peak.

Station mark: Tablet under a large monument.

Reference mark: A chiseled cross on solid rock 12.50 feet northwest.

[Latitude 45° 00′ 03.98″. Longitude 114° 25′ 44.49″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Middle Fork	76 35 07.33	256 25 33.07	4.2625318	11.373
M. P. 12	149 16 43.00	329 13 21.00	4.08747	7.600
Baldy	244 01 19.00	64 19 11.00	4.5659159	22.870
Low	265 13 02.00	85 23 07.00	4.27401	11.678
Taylor	307 10 46.51	127 19 50.12	4.3262490	13.170

REDWINGS, CUSTER COUNTY, IDAHO.

On the northernmost one of five peaks of a short, isolated, high, red-rock mountain, locally known as Sheep Mountain, on ridge between the waters of Herd Creek and the main East Fork of Salmon River, at the head of McDonald and Fox creeks to the north and west into the East Fork of Salmon and Taylor Creek and other tributaries of Herd Creek to the east. About 15 miles south of the junction of the East Fork and main Salmon River, 6 miles south of the mouth of Herd Creek. Can be reached either from the East Fork or Herd Creek.

Station mark: A chiseled cross on rock under a very large monument.

Reference mark: A chiseled cross on rock set 7.25 feet west.

[Latitude 44° 03′ 53.76″ (from south). Longitude 114° 21′ 34.08″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Twin (from north)	171 04 24.45	350 59 31.97	4.7744793	36.968
Grouse (from north)	200 43 47.67	20 54 54.96	4.7748586	37.001
Beauty (from north)	259 53 34.45	80 17 45.35	4.67276	29.249
Herd (from north)	308 55 04.13	129 00 40.12	4.14135	8.604
Ram (from south)	182 10 35.84	.....	4.5272098	20.920
Spar (from south)	222 29 48.89	.....	4.4190339	16.307
Anderson (from south)	241 02 53.51	61 16 56.01	4.4873088	19.084
Jerry (from south)	271 21 22.57	91 31 54.11	4.3057363	12.563
Porphyry (from south)	294 25 49.51	114 42 44.00	4.5536465	22.233
Smiley (from south)	312 20 33.65	132 43 26.60	4.7781759	37.284

REED & DAVIS, CUSTER COUNTY, IDAHO.

On a low lone grassy hill in upper Copper Basin, between East Fork of Lost River and Star Hope Creek. Two miles west of Reed & Davis copper mine and 25 miles southwest of Mackay. A good view of the entire copper basin from the point.

Station mark: A chiseled cross on solid rock over which is centered a large monument.

Reference mark: Aluminum tablet set in solid rock 5.7 feet north.

[Latitude 43° 49′ 02.0″. Longitude 113° 51′ 12.7″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Starhope	130 20 28	310 18 30	3.68732	3.024
Porphyry	147 31 16	327 27 06	4.17590	9.316
Shelly	263 59 14	84 04 33	4.01480	6.429

ROBINSON BAR, CUSTER COUNTY, IDAHO.

On the northern of two rocky peaks in the mountains on the west side of Warm Springs Creek and south of main Salmon River. About 5 miles south of Robinson Bar Hotel, on the stage road at the junction of Warm Springs Creek and Salmon River, 12 miles east of Stanley Basin. The station gives a good view of the Sawtooth Range. Easily reached from the Warm Springs Creek trail.

Station mark: A chiseled cross on solid rock under a tree signal and a monument of big bowlders.

Reference mark: A chiseled cross on solid rock 12.5 feet northeast.

[Latitude 44° 12′ 20.87″. Longitude 114° 44′ 25.73″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Trap	192 13 07.94	12 17 17.16	4.5703090	23.103
Ram	240 17 09.23	60 33 47.37	4.5616082	22.644

ROCKY, LEMHI COUNTY, IDAHO.

On a high rocky peak locally known as Rocky, on a side ridge, between Twin and Ditch creeks, Salmon River basin, about 1 mile east of the main Bitter Root divide, milepost 412, Idaho-Montana boundary. Horses can be taken to the top by following the high divide east and north from State-line trail at milepost 411 or by coming up the trails from Gibbonsville to Alta, Mont. Cut-off trail leaves milepost 409 and joins wagon road on Hughes Creek, Mont.; also another at the 4 A. P. M. 405 connects with wagon road up the south fork of Hughes Creek at milepost 407 trail, goes southeast, connecting with Gibbonsville and Salmon City wagon road up North Fork of Salmon River at mouth of Ditch Creek. Fair summer camping grounds in basin on all sides of the peak, but good camping on saddle on State-line trail near milepost 410.

Station mark: Center of large monument 12 feet high.

Reference mark: Tablet 7.7 feet northwest.

[Latitude 45° 35′ 43.92″. Longitude 114° 03′ 15.72″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Blue Nose	60 15 04.58	240 02 06.28	4.4358926	16.953
Castle	113 09 28.69	292 51 49.01	4.5422361	21.656
Piquett	145 14 24.24	325 08 34.41	4.2682945	11.524
Trapper	150 09 06.90	329 58 41.61	4.5777112	23.500
Deer	180 00 45.57	00 00 45.92	4.6805395	29.777
Saddle	202 04 06.24	22 07 09.50	4.1687967	9.165
Johnson	224 29 41.42	44 44 23.72	4.5791919	23.580
Ruby	272 55 29.00	93 08 38.00	4.37965	14.893
Big Hole Pass	288 24 41.00	108 34 30.00	4.27502	11.705
Sheep	298 54 01.02	119 06 38.37	4.4203509	16.356

SADDLE, FREMONT COUNTY, IDAHO. (Not occupied.)

On Saddle Mountain, a high rocky peak on Cedar Point, which is the southeast end of the Little Lost River Range. Ten miles north of Howe and 20 miles southwest of Reno. Water and grass at springs at head of South Creek, the nearest camping place. Horses can be taken about 1,000 feet below top.

Station mark: A triangulation tablet set in placed rock centered under a large monument.

Reference mark: A chiseled cross on solid rock 27 feet southwest.

[Latitude 43° 56′ 16.3″. Longitude 112° 57′ 13.5″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Jumpoff	31 12 42	211 06 21	4.37533	14.746
King	55 34 10	235 20 53	4.49390	19.375
East Butte	334 22 37	154 34 34	4.73392	33.673

SAL, LEMHI COUNTY, IDAHO.

On the highest dome-shaped, partly timbered rocky mountain between the forks of Lemhi and Salmon rivers. About 10 miles south of Salmon. Best reached by taking the Warm Springs road to Mill Creek, the end of the road, thence by trail along the east face of the mountain just below slide rock to a mine on top of hill north of station, thence along ridge to station.

Station mark: A triangulation tablet cemented in a large rock under big monument.

Reference mark: A chiseled cross on solid rock 14.9 feet south.

[Latitude 45° 00′ 56.83″. Longitude 113° 50′ 31.70″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Lem	4 04 59.82	184 04 00.00	4.41728	16.242
Grouse	21 49 55.82	201 39 16.65	4.7310495	33.450
Baldy	137 48 24.08	317 41 20.43	4.2891545	12.092
Graveyard	171 54 31.00	351 53 18.00	4.20204	9.895
Sheep	181 07 04.56	7 10 35.54	4.7166018	32.356
Goldstone	241 09 49.35	61 21 09.08	4.3794112	14.885
Bloody Dick	249 17 02.37	69 39 08.08	4.6406653	27.165
E and W	302 17 06.05	122 34 36.24	4.5870729	24.012
Hi Peak	358 41 37.82	178 42 04.48	4.56247	22.689

SALMON, IDAHO COUNTY, IDAHO. (Not occupied.)

Station mark: Monument on summit of Salmon Peak.

[Latitude 45° 37′ 03.2″. Longitude 114° 50′ 09.3″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Trapper	233 56 13.00	54 19 22.00	4.71405	32.166
Piquett	255 30 44.00	75 58 26.00	4.71525	32.255

SCORPION, BLAINE COUNTY, IDAHO.

On Scorpion Mountain on side ridge between Muldoon and Garfield creeks, 1 mile south of the main divide between East Fork of Lost River and Wood River basins, The trail from Copper Basin to Muldoon Creek comes through the first pass in sight and 1 mile east of station. Three miles north of the old mill on Muldoon Creek. The monument is about center of the mountain, the south end of which is several feet higher.

Good camping grounds in the head of the creeks around the mountain. About one hour's climb afoot.

Station mark: A chiseled cross on placed rock centered under large monument.

Reference mark: A triangulation tablet in solid rock 15.2 feet southwest.

[Latitude 43° 37′ 57.78″. Longitude 113° 53′ 05.28″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Buzz	12 59 37	192 56 37	4.41073	16.232
Garfield	67 27 01	247 23 00	3.92839	5.269
Porphyry	170 30 45.10	350 27 53.26	4.5264167	20.882
Smiley	219 12 21.21	39 15 28.89	3.9835899	5.983
Crawford	252 55 06.14	73 12 10.89	4.5408977	21.590
Pion	283 36 20	103 37 56	3.53644	2.137
Blizzard	310 13 53.10	130 22 51.43	4.3614759	14.283
Crooks	342 46 47	162 50 37	4.40511	15.793
Freedom	350 15 47	170 17 01	4.15609	8.901

SHEEP 1 A. P. 452, IDAHO-MONTANA (LEMHI COUNTY, IDAHO; BEAVERHEAD COUNTY, MONT.).

Station mark: State line boundary post.

[Latitude 45° 28′ 50.46″. Longitude 113° 45′ 34.60″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Baldy	27 42 58.24	207 32 21.66	4.6238484	26.134
Blue Nose	89 12 36.52	268 47 02.43	4.6696893	29.042
Rocky	119 06 38.37	298 54 01.02	4.4203509	16.356
Johnson	185 18 33.53	5 20 16.04	4.6015059	24.823

SHELLY, CUSTER COUNTY, IDAHO.

On the east and highest of the five peaks on a high red-slate ridge extending northwest and southeast, locally known as Shelly Mountains. The peak is sometimes called Bird Peak and divides the waters of East Fork of Lost River and Antelope Creek. Cabin, Cherry, and Alder creeks all head at the peak. Eight miles south of Mackay City and 4 miles northeast of Reed & Davis copper mine in Copper basin. Easiest reached from the head of Cabin Creek, Cherry Creek, or the extreme tributary of northeast East Fork of Lost River.

Station mark: A chiseled cross on placed rock centered under large monument.

Reference mark: Triangulation tablet set in solid rock 8 feet south.

[Latitude 43° 49′ 36.89″. Longitude 113° 43′ 32.16″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Smiley	25 32 53.54	205 29 25.14	4.1943469	9.721
Copper Basin Knob	51 25 23	231 20 18	4.10078	7.84
Copper Basin ranger station	76 29 31	256 25 00	3.95473	5.60
Standhope	79 09 44	258 57 19	4.38900	15.22
Reed & Davis	84 04 33	263 59 14	4.01480	6.43
Starhope	98 29 10	278 21 56	4.15079	8.79
Porphyry	122 19 14.8	302 09 45.42	4.3361139	13.473
Anderson	150 02 56.21	329 50 31.58	4.6782155	29.619
Mackay	196 33 14.42	16 34 18.94	3.8630279	4.533
King	278 12 36.14	98 31 23.38	4.5657993	22.864
Crawford	299 15 46.53	119 26 16.39	4.3685909	14.519
Lope	308 16 45	128 22 19	4.13809	8.54
Timbered Dome (tree)	327 47 58	147 55 37	4.44620	17.74
Taylors White House	328 22 41	148 27 31	4.24892	11.02
Black Cap	333 21 57	153 26 42	4.31382	12.80

SHELDON, LEMHI COUNTY, IDAHO. (Not occupied.)

On a prominent red-rock peak on divide between Camas and Warm Spring creeks. About 10 miles southeast of Three Forks ranch. The trail from Camas Creek to Warm Springs Creek crosses the divide near the peak. Peak is locally known to the forest rangers.

Station mark: Center of peak; no monument.

[Latitude 44° 42′ 00.01″. Longitude 114° 33′ 39.67″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Prominent	63 00 24.00	242 45 26.00	4.50032	19.665
Sleeping Deer	126 20 14.00	306 14 46.00	4.10429	7.900

SLEEPING DEER, LEMHI COUNTY, IDAHO.

On the highest peak on the divide between Camas and Loon creeks. Cabin and Cache creeks, Loon Creek drainage, to the west; west part of Camas Creek to the east. Woodtick Creek heads about 1 mile north. About 15 miles southwest of Three Forks ranch, Myers Cove post office.; 30 miles southwest of Forney and 15 miles south-east of the junction of Loon Creek and Middle Fork of Salmon River, Ramey's ranch. The trail from the Three Forks ranch up the west fork of Camas Creek crosses the divide at the head of Woodtick Creek 1 mile north of station and goes down Cache Creek to Loon Creek and Middle Fork of Salmon River. From this trail in the pass a good route to the peak is south along the divide to a lake and grass at the north foot in the upper basin of Cache Creek.

Station mark: Triangulation tablet under a large monument.

Reference mark: A chiseled cross on a big bowlder 53.9 feet west.

[Latitude 44° 46′ 03.79″. Longitude 114° 41′ 25.39″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Prominent	39 15 46.25	219 06 15.23	4.4520672	17.596
Ray Sheep	53 34 06.00	233 20 41.00	4.49652	19.492
Middle Fork	187 24 30.01	7 26 00.69	4.3394058	13.576
Taylor	250 36 20.68	70 56 26.49	4.5998195	24.726
Sheldon	306 14 46.00	126 20 14.00	4.10429	7.900
Twin	318 33 22.77	138 42 26.15	4.4108000	16.001
Trap	351 31 54.03	171 33 57.75	4.4215253	16.401

SMILEY, CUSTER COUNTY, IDAHO.

On Smiley Mountain, a very high prominent peak, half a mile east of the main divide between East Fork of Lost River and Antelope Creek. At the head of Bear and Iron Bog creeks, drainage of Antelope Creek and Lake Creek, a tributary of Starhope Creek. About 8 miles south of Reed & Davis copper mine, in Copper basin; 15 miles west of Grouse post office. Horses can be taken to the station from the Lake Creek side.

Station mark: A chiseled cross on placed rock centered under a very large monument.

Reference marks: (1) Aluminum bench-mark tablet set in rock buried 1 foot under rocks 5.6 feet northwest—a small stake marks the place; (2) chiseled cross on rock in hole 11.2 feet north.

[Latitude 43° 41′ 59.46″. Longitude 113° 48′ 33.46″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Pion	18 22 31	198 21 06	3.94039	5.42
Scorpion	39 15 28.89	219 12 21.21	3.9835899	5.983
Standhope	118 43 45	298 34 50	4.29551	12.27
Redwings	132 43 26.60	312 20 33.65	4.7781759	37.284
Big Black Dome	135 01 10	314 54 06	4.28689	12.03
Copper Basin Knob	153 28 04	333 26 28	3.84400	4.34
Porphyry	155 41 55.53	335 35 55.40	4.4501498	17.519
Ante	204 07 33	24 10 03	4.07471	7.380
Shelly	205 29 25.14	25 32 53.54	4.1943469	9.721
Lope	252 13 43	72 22 45	4.26501	11.44
Crawford	264 16 29.47	84 30 27.01	4.4355977	16.941
Taylors White House	273 28 31	93 36 46	4.20622	9.99
Timbered Dome (tree)	293 42 27	113 53 33	4.37364	14.69
Blizzard	333 51 25.44	152 57 16.65	4.3993359	15.584

SPAR, CUSTER COUNTY, IDAHO.

On a black-rock knob on a sagebrush hill on the divide between Spar Creek and Road Canyon, near their heads. About 8 miles east of the bridge across East Fork of Salmon River; between 2 and 3 miles south of the forks of the old Bay Horse road from the present Mackay-Clayton road at the elbow near Gossi Summer ranch.

Station mark: A chiseled cross under a rock monument.

Reference mark: A chiseled cross on solid rock 5.35 feet northeast.

[Latitude 44° 14′ 19.88″. Longitude 114° 08′ 15.13″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Twin	145 47 22.00	325 33 09.91	4.6790802	29.678
Grouse	185 25 10.46	5 26 59.76	4.5622512	22.678

STANDHOPE, CUSTER COUNTY, IDAHO. (Not occupied.)

On one of a number of high peaks on the divide between Standhope and Fall Creek. Three miles east of Mount Hyndman Peak and 8 miles west of Reed & Davis copper mine, in Copper basin. Best reached from the east by following up the west fork of Standhope Creek. A long rough climb afoot.

Station mark: A tablet in placed rock under center of large monument.

Reference mark: A chiseled cross on solid rock 7.2 feet west.

[Latitude 43° 47′ 06.3″. Longitude 114° 01′ 27.9″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Shelly	258 57 19	79 09 44	4.38900	15.218
Smiley	298 34 50	118 43 45	4.29551	12.269
Scorpion	326 20 32	146 27 10	4.30804	12.630

STARHOPE, CUSTER COUNTY, IDAHO.

On a grassy hill, bluffy on east, in Copper basin, on west side of Starhope Creek. One mile south of the junction of Starhope Creek and East Fork of Lost River; 4 miles west of Reed & Davis copper mine. Easily reached from all directions.

Station mark: Chiseled cross on placed rock centered under bowlder monument.

Reference mark: Aluminum tablet 4.5 feet north.

[Latitude 43° 50′ 44.1″. Longitude 113° 53′ 58.7″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Porphyry	155 24 06	355 21 51	4.01883	6.488
Shelly	278 21 56	98 29 10	4.15079	8.793
Reed & Davis	310 18 30	130 20 28	3.68732	3.024

SUMMIT ROCK, CUSTER COUNTY, IDAHO.

On a high rock knob on a timbered hill on the divide between the waters of the Yankee Fork to the west and Challis and Mill creeks to the east. Six miles west of Mosquito Flats, on Challis Creek, and 18 miles east of Bonanza. The wagon road from Challis, 16 miles east, to Custer, 16 miles west, crosses the divide at the heads of Mill and Summit creeks in view of and 1 mile southeast of station.

Station mark: A chiseled cross on solid rock under a large monument.

Reference mark: A triangulation tablet in solid rock 16.95 feet northeast.

[Latitude 44° 29′ 38.09″. Longitude 114° 29′ 47.35″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Mount Eustes	72 43 08.02	252 34 07.22	4.2522856	11.108
Twin	188 26 42.77	8 27 35.19	4.0501070	6.973

SUNSET, CUSTER COUNTY, IDAHO. (Not occupied.)

On the first high peak, main backbone Lost River Range, east of Pass Creek pass, through which the road from Mackay to Little Lost River goes; about 5 miles east and easily reached from the Pass Creek ranger station.

Station mark: Chiseled cross on placed rock centered under a large monument.

Reference mark: A triangulation tablet set in solid rock under small rock pile 17.10 feet southeast.

[Latitude 43° 58′ 35.1″. Longitude 113° 22′ 09.2″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Crawford	16 32 20	196 28 02	4.46640	18.188
Mackay	70 11 21	249 57 10	4.45068	17.540
King	340 36 35	160 40 35	4.36698	14.467

TAYLOR, LEMHI COUNTY, IDAHO.

On the highest rocky mountain on divide between Moyer Creek to the west and Hat Creek to the east, Morgan Creek to the south, all Salmon River drainage. About 8 miles southeast of Forney post office and 25 miles north of Challis, Idaho. The wagon road connecting these two places crosses the divide between Panther and Morgan creeks about 5 miles southwest of station. Best route is up the divide on the north side of Lake Creek; camping grounds in basins on all sides of the peak.

Station mark: A triangulation tablet under a large monument.

Reference mark: A chiseled cross on solid rock 6.9 feet north.

[Latitude 44° 53′ 08.32″. Longitude 114° 12′ 54.97″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Twin	32 33 09.40	212 22 09.38	4.5847348	23.883
Black Mountain	64 09 13.92	244 03 48.05	4.0519739	7.003
Sleeping Deer	70 56 26.49	250 36 20.68	4.5998195	24.726
Middle Fork	104 00 55.98	283 42 18.83	4.5530661	22.203
Wilson	125 05 49.98	304 48 28.90	4.59506	24.457
Red Rock	127 19 50.12	307 10 46.51	4.3262490	13.170
Puddin	127 55 45.98	307 38 14.00	4.61501	25.608
Forney	128 35 22.98	308 30 23.75	4.0749643	7.384
Quartzite	136 58 15.00	316 48 28.00	4.42558	16.555
Bee Hive	144 50 40.01	324 36 26.09	4.6600568	28.406
Low	187 26 51.00	7 27 52.00	4.16115	9.005
Baldy	209 23 49.98	29 32 36.87	4.5205800	20.603
Grouse	344 50 53.59	164 56 00.42	4.5660021	22.875

TAYLOR'S WHITE HOUSE, CUSTER COUNTY, IDAHO. (Not occupied.)

Two-story white frame, house owned by Mr. Taylor. On the flat between the junction of Antelope and Cherry creeks about 1 mile east of Grouse post office. Ranch is known as the old Cherry ranch.

Station mark: Center of house.

[Latitude 43° 41′ 27.3″. Longitude 113° 36′ 36.9″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Smiley	93 36 46	273 28 31	4.20622	9.991
Ante	136 40 31		4.21156	10.114
Shelly	148 27 31	328 22 44	4.24892	11.022

THE GENERAL, CUSTER COUNTY, IDAHO.

On the highest reddish-white peak on the main divide between Salmon and the Middle Fork of Salmon rivers, at the heads of Mayfield, Big Loon, and Lightning creeks; about 6 miles northwest of Sunbeam Mill and 8 miles south of Loon Creek Center ranger station. Can be reached by following up the above-named creeks. The best route is up Jordan Creek to Mount Jordan, thence along the main divide to station. There is only one saddle between the two peaks.

Station mark: A chiseled cross on rock set under large monument.

Reference mark: A triangulation tablet in large boulder 30.90 feet northwest.

[Latitude 44° 29′ 02.37″. Longitude 114° 48′ 07.67″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Prominent	136 39 30.63	316 34 43.15	4.1199010	8.189
Trap	246 57 02.71	67 03 48.13	4.1422912	8.623

THOMPSON PEAK, CUSTER-BOISE COUNTY, IDAHO. (Not occupied.)

On the north high sharp peak of the Sawtooth Range. The mountains to the south are very rough and high, to the northwest they are much lower and smoother; about 10 or 15 miles west of Stanley. The peak is very prominent and well-defined.

Station mark: Center of peak.

[Latitude 44° 12′ 47.46″. Longitude 115° 04′ 51.53″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Prominent	198 16 27.00	18 23 22.00	4.62109	25.968
Trap	224 27 13.00	44 45 42.00	4.69794	30.995

TIMBER CREEK, LEMHI COUNTY, IDAHO.

On the south one of two big rocky domes in the Lemhi Mountains on the east side of Timber creek; about 15 miles south of Leadore, Idaho. Easily reached from the Timber Creek trail.

Station mark: Triangulation tablet in large rock under monument.

Reference mark: A chiseled cross on solid rock 14.90 feet distant.

[Latitude 44° 29′ 47.22″. Longitude 113° 24′ 17.98″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
E and W	177 03 28.56	357 02 27.73	4.56864	23.014
Horse Prairie	215 52 40.00	36 03 58.00	4.55911	22.514
Garfield Mountain	267 14 12.00	87 47 12.00	4.79568	38.818
Eighteen-mile Peak	279 17 08.00	99 34 20.00	4.51879	20.518

TIMBERED DOME, BLAINE COUNTY, IDAHO. (Not occupied.)

A prominent partly timbered hill on grassy divide between waters of Grass Creek and drainage east to Lava Beds, about 3 miles north of the pass through which the road goes from Dry Fork of Antelope Creek to Champagne Creek.

Station mark: Tallest tree.

[Latitude 43° 36′ 50.4″. Longitude 113° 32′ 28.2″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Blizzard	38 42 16	218 37 13	4.21426	10.177
Smiley	113 53 33	293 42 27	4.37364	14.688
Shelly	147 55 37	327 47 58	4.44620	17.359
Crawford	204 21 28	24 24 52	4.12713	8.327

XIII, IDAHO COUNTY, IDAHO. (Not occupied.)

On round peak, about 6 miles south of Salmon Peak.

[Latitude 45° 31′ 47.2″. Longitude 114° 45′ 41.2″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Blue Nose			4.50810	20.019
Trapper			4.73247	33.560
Piquett			4.69827	31.018
Rocky			4.74573	34.600

356 IDAHO-MONTANA BOUNDARY LINE. (Secondary point.)

On a grassy hill with scattered trees on main divide Bitter Root Range, 93 feet south of small iron State-line angle post, marked "Idaho-Montana 1 A P 356 M" and 840 feet by stepping north of big iron post marked "Idaho-Montana 356.062 M." The Elk City trail passes by the side of the station. Good camping place in Nez Perce Pass, 1 mile south on State-line trail.

Station mark: A chisel cross in rock set under quadripod signal.

Reference mark: Small iron angle post 1 A P 356 M, 93 feet north.

[Latitude 45° 44′ 07.00″. Longitude 114° 31′ 51.87″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Trapper	226 28 11.38	46 38 15.97	4.3992043	15.580
Piquett	270 31 54.71	90 46 33.44	4.4237628	16.486
Castle	290 35 51.71	110 38 39.58	3.7337278	33.658

TRAP, CUSTER COUNTY, IDAHO.

On a very conspicuous red-rock cone-shaped peak (called Sherman Peak) on a high ridge between East Mayfield Creek and Trappers Creek, a fork of Warm Springs Creek. About 1 mile north of the main divide between the waters of main Salmon and Middle Fork of Salmon River. Ten-mile Creek, a tributary of Yankee Fork, heads in a low saddle opposite the head of Trappers Fork of Warm Springs Creek, about 2 miles south. The new trail from Challis, via Mosquito Flat and Yankee Fork, crosses the ridge between Trappers Fork and East Mayfield Creek about 1 mile south of peak. Challis is about 30 miles east and Loon Creek Center 15 miles west. Only grass is at the head of Yankee Fork and at the forks of East Mayfield Creek.

Station mark: A bronze tablet under a large monument.

Reference mark: A chiseled cross on rock set under small rock pile 6.50 feet north. This was the point occupied.

[Latitude 44° 31′ 57.98″. Longitude 114° 38′ 29.34″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Robinson Bar	12 17 17.16	192 13 07.94	4.5703090	23.103
McGowan	37 02 58.71	216 54 30.57	4.4262530	16.581
Thompson Peak	44 45 42.00	224 27 13.00	4.69794	30.995
The General	67 03 48.13	246 57 02.71	4.1422912	8.623
Prominent	100 53 20.66	280 41 47.32	4.3464774	13.798
Ray Sheep	104 25 56.00	284 10 29.00	4.27815	18.685
Ramey	151 50 51.00	231.41 27.00	4.57197	23.191
Sleeping Deer	171 33 57.75	351 31 54.03	4.4215253	16.401
Twin	242 41 22.82	62 48 21.54	4.1706285	9.204
Ram	307 36 29.14	127 49 00.61	4.4770013	18.636
Potaman	330 27 22.10	150 37 40.17	4.5996871	24.719

TWIN, CUSTER COUNTY, IDAHO.

On the south peak of Twin Peaks on the main divide between the basins of main Salmon and Middle Fork of Salmon rivers. Bear Creek to the east and Warm Springs Creek, a tributary of Loon Creek, to the west. About 20 miles northwest of Challis. Six miles east of the old Parker Mountain Mine. The trail and telephone line from Challis up Bear Creek and down Warm Springs Creek passes through the saddle between the two peaks about a quarter of a mile north of peak. About 1,000-foot climb from pass to top. A ranger cabin is at the head of Bear Creek but no horse feed within 6 miles. The peak is used as a lookout station point by the Forest Service. Besides the Survey monument there is a large half-circle rock wind wall protecting the telephone.

Station mark: A triangulation tablet under a large monument.

Reference marks: The center of three posts used as a protractor station, the north end of the rock wall, the center of the rock wall, and the south end of the rock wall.

[Latitude 44° 35′ 37.72″. Longitude 114° 28′ 32.62″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Summit Rock	8 27 35.19	188 26 42.77	4.0501070	6.973
Mount Eustes	48 46 15.16	228 36 21.49	4.3960898	15.468
Trap	62 48 21.54	242 41 22.82	4.1706285	9.204
Sleeping Deer	138 42 26.15	318 33 22.77	4.4108000	16.001
Taylor	212 22 09.38	32 33 09.40	4.5847348	23.883
Grouse	275 43 31.01	95 59 35.22	4.4838014	18.930
Challis	296 40 42.00	116 49 40.00	4.27740	11.769
Beauty	312 11 16.97	132 40 27.38	4.87564	46.664
Lone Pine	318 26 18.00	138 39 11.00	4.56600	22.874
Spar	325 33 09.91	145 47 22.00	4.6790802	29.678
Bay Horse	333 04 15.00	153 09 16.00	4.32112	13.016
Ram	337 13 26.23	157 19 00.00	4.4352802	16.929
Redwings	350 59 31.97	171 04 24.45	4.7744793	36.968

WAUGH MOUNTAIN, IDAHO COUNTY, IDAHO. (Not occupied.)

Station mark: Monument on summit of Waugh Mountain.

[Latitude 45° 29′ 41.4″. Longitude 114° 47′ 31.4″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Blue Nose			4.53266	21.184
Trapper			4.76718	36.352
Piquett			4.73131	33.470
Rocky			4.76855	36.467

WILSON, LEMHI COUNTY, IDAHO. (Not occupied.)

On a high peak at the head of Wilson Creek. It is the last high rocky peak south of Mount McGuire. Can be reached by following the divide north from the Yellow Jacket–Mormon ranch trail. No monument.

[Latitude 45° 05′ 18.81″. Longitude 114° 37′ 27.57″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Baldy	262 21 21.60	82 47 32.87	4.68914	30.373
Taylor	304 48 28.90	125 05 49.98	4.59506	24.457

BLOODY DICK, BEAVERHEAD COUNTY, MONT.

On the highest peak on the Bloody Dick Divide, which separates the waters of the Big Hole River to the north and the waters of the Horse Prairie Creek to the south. About 15 miles south of Jackson in the Big Hole and the same distance northwest of Grant, a station on the Pittsburgh & Gilmore Railroad on Horse Prairie Creek. It is easily reached from a cow ranch in the Bloody Dick basin.

Station mark: A triangulation tablet cemented into a solid rock under a large monument.

Reference mark: A chiseled cross on solid rock 14 feet south.

[Latitude 45° 09′ 13.54″. Longitude 113° 19′ 19.66″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
E and W	13 11 52.61	193 07 20.50	4.5685499	23.009
Sal	69 39 08.08	249 17 02.37	4.6406653	27.165
South Pyramid	122 22 12.00	302 07 06.00	4.51723	20.445
Torrey Mountain	219 05 44.00	39 20 40.00	4.63786	26.991
Polaris	225 49 40.00	46 02 18.00	4.51056	20.133
Brenner	329 58 38.81	150 05 40.71	4.4169157	16.228
Horse Prairie	341 26 26.09	161 34 17.52	4.6637226	28.646
J. C. B	346 16 11.33	166 19 06.14	4.3581100	14.173

BLUE NOSE, RAVALLI COUNTY, MONT. (IDAHO-MONTANA STATE BOUNDARY LINE).

On a rocky mountain, old burn on south, on State line at angle point between milepost 389.245 and 390.181, about 1.5 miles west of South Pass, where the old Shoup trail crosses the State-line trail and about 2 miles east of the Shoup wagon road crossing the State-line trail. The point is easily reached by the State-line trail on the south slope of the mountain. Good camping place on south slope of hill. Spring below Shoup trail. Miner's cabin in basin north foot of same hill.

Station mark: A chiseled cross on slanting solid rock under an 8-foot monument.

Reference mark: A bronze triangulation tablet cemented into a large bowlder 11.25 feet southwest.

[Latitude 45° 28′ 23.97″. Longitude 114° 21′ 26.26″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Bee Hive	28 28 05.53	208 19 50.98	4.5026912	19.772
Trapper	185 46 34.85	5 49 10.48	4.6683359	28.953
Piquett	204 16 53.09	24 24 02.83	4.4999957	19.649
Rocky	240 02 06.28	60 15 04.58	4.4358926	16.953
Sheep	268 47 02.43	89 12 36.52	4.6696893	29.042
Baldy	322 58 20.14	143 13 13.26	4.6587317	28.320

BRENNER, BEAVERHEAD COUNTY, MONT.

On the north end of a grassy hill at the high north end of divide between Horse Prairie and Sage creeks. In view from both Brenner and Grant railroad stations, Grant being about 7 miles northeast and Brenner about 6 miles northwest.

Station mark: A triangulation tablet cemented in rock set under a large monument.

Reference mark: A chiseled cross on solid rock 18.9 feet south.

[Latitude 44° 57′ 00.59″. Longitude 113° 09′ 23.55″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
E and W	58 08 03.10	237 56 30.78	4.4043716	15.766
Bloody Dick	150 05 40.71	329 58 38.81	4.4169157	16.228
Polaris	192 48 09.00	12 53 43.00	4.66577	28.782
Torrey Mountain	194 23 13.00	14 31 03.00	4.76430	36.112

CASTLE, RAVALLI COUNTY, MONT.

A secondary point on an isolated, rocky knob locally called Castle Rock. About 1 mile east of State line (Idaho-Montana) monument 1 A. P. 359 on the ridge leaving the main summit of the Bitter Root Range at that point and dividing the waters of Blue Joint Creek on the south and Nez Perce Fork or the West Fork of the Bitter Root on the north. The Elk City trail down the ridge passes on south foot of knob and about 500 feet lower than monument. The junction of the two trails, one down the ridge and the other down Nez Perce Fork, is in Nez Perce Pass.

Station mark: A chiseled cross in solid rock under an 8-foot monument.

Reference mark: A hole chiseled for tablet 9.8 feet southeast.

[Latitude 45° 43′ 05.21″. Longitude 114° 27′ 57.42″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
356	110 38 39.58	290 35 51.71	3.7337278	33.658
Piquett	265 37 30.89	85 49 21.61	4.3329241	13.375
Rocky	292 51 49.01	113 09 28.69	4.5422361	21.656

COUNTY LINE, RAVALLI AND BEAVERHEAD COUNTIES, MONT.

On a high, rocky, dome-shaped peak on the Continental Divide at the junction of the divide that separates the waters of Bitter Root River and Rock Creek. East Fork of Bitter Root River, Rock Creek, a tributary of Clarks Fork, and Rock Creek, a tributary of Big Hole River, head at the peak. The station is easily reached by following the road and trail up East Fork of Bitter Root River to the divide and then the divide for about 1 mile to the north foot of the peak, where horses are left, thence a short climb over rocks and bowlders. Good camping grounds at old miner's cabin in the northeast corner of the basin at the head of East Fork of Bitter Root River.

Station mark: The center of a large rock monument.

Reference mark: A bronze tablet cemented in rock set 10 feet northeast of station.

[Latitude 45° 56′ 22.05″. Longitude 113° 30′ 55.08″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Saddle	56 07 41.73	235 47 33.55	4.6422064	27.262
Shirley	78 05 06.01	258 49 01.06	4.4713759	18.396
Deer	103 15 54.98	282 52 39.73	4.6321691	26.639
Kent	122 56 32.33	302 44 31.95	4.4090435	15.937
Warren	219 32 49.18	39 35 15.45	3.8373995	4.273

DEER, RAVALLI COUNTY, MONT.

Summit of peak locally known as Deer Peak, about 6 miles east of Darby and 6 miles north of Ray's ranch on Rye Creek. Easily reached from west or south. Ray's ranch is the closest camp place.

Station mark: A chiseled cross on solid rock under a large monument and quadripod signal.

Reference mark: A triangulation tablet set in solid rock 25.40 feet north.

[Latitude 46° 01′ 36.10″. Longitude 114° 03′ 15.23″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Rocky	00 00 45.92	180 00 45.57	4.6805395	29.778
Piquett	17 56 44.35	197 50 52.88	4.5360015	21.348
Trapper	51 14 28.10	231 04 00.18	4.3829476	15.007
Ward (2)	131 48 29.40	311 38 31.12	4.3783358	14.849
Palisades	204 55 38.43	25 03 33.92	4.5246832	20.799
Kent	258 06 53.32	78 18 09.10	4.3142370	12.811
County line	282 52 39.73	103 15 54.98	4.6321691	26.639
Johnson	308 06 37.42	128 21 22.59	4.5287627	20.993
Shirley	320 57 09.33	141 04 18.27	4.3101738	12.692
Saddle	350 49 37.25	170 52 40.84	4.5402883	21.559

J. C. B., BEAVERHEAD COUNTY, MONT.

On a sharp, prominent low peak in the Horse Prairie Valley. One-quarter mile east of Pittsburgh & Gilmore Railroad track. One mile east of Brenner station; 0.5 mile east of J. C. Brenner's ranch.

Station mark: A triangulation tablet under a large monument.

Reference mark: A chiseled cross on solid rock 7.5 feet northwest.

[Latitude 44° 57′ 15.70″. Longitude 113° 15′ 12.67″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
E and W	44 59 40.97	224 52 15.02	4.2929420	12.198
Bloody Dick	166 19 06.14	346 16 11.33	4.3581100	14.173
Pass	354 19 04.41	174 20 29.44	4.42829	16.659

JOHNSON, RAVALLI AND BEAVERHEAD COUNTIES, MONT.

On a big, flat burnt-rock hill on Continental Divide, boundary between Ravalli and Beaverhead counties. The divide trail passes along the south slope of the hill. The trail that leaves East Fork of Bitter Root River at Johnson's ranger cabin 10 miles east of Sula post office passes over the north end of the hill and joins the divide trail in the saddle on the east.

Station mark: A chiseled cross on solid rock under a large monument and tripod signal.

Reference mark: A triangulation tablet.

[Latitude 45° 50′ 18.84″. Longitude 113° 42′ 43.31″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Sheep	5 20 36.04	185 18 33.53	4.6015059	24.823
Ruby	5 36 44.00	185 35 12.00	4.45356	17.657
Rocky	44 44 23.72	224 29 41.42	4.5791919	23.580
Saddle	57 46 11.39	237 34 31.78	4.3971479	15.507
Deer	128 21 22.59	308 06 37.42	4.5287627	20.993
Kent	165 55 29.58	345 51 58.90	4.4133835	16.097

PIQUETT, RAVALLI COUNTY, MONT.

On an isolated rocky dome-shaped mountain at the extreme south head of Piquett, Little Boulder, and Warm Springs creeks, about 25 miles south of Darby. Four miles east of the West Fork of Bitter Root, where Blue Joint Creek comes in from the west. Can be reached from the divide between Overwhich and Slate creeks on the south or either of the divide trails from the north. The trail passes by the lakes on the east and north slope of the hill. Good camping place on the lake at the head of creek on trail 500 feet from summit of peak. Horses can be taken nearly to the top.

Station mark: A chiseled cross on placed rock under a large monument.

Reference mark: A bronze tablet cemented into rock by small rock pile 27.5 feet southeast.

[Latitude 45° 43′ 57.18″. Longitude 114° 11′ 24.82″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Blue Nose	24 24 02.83	204 16 53.09	4.4999957	19.649
Castle	85 49 21.61	265 37 30.89	4.3329241	13.375
356	90 46 33.44	270 31 54.71	4.4237628	16.486
Trapper	154 44 57.28	334 40 21.98	4.2879001	12.057
Deer	197 50 52.88	17 56 44.35	4.5360015	21.348
Saddle	275 27 40.64	95 36 34.32	4.2093231	10.062
Rocky	325 08 34.41	145 14 24.24	4.2682945	11.524

POLARIS, BEAVERHEAD COUNTY, MONT. (Not occupied.)

A monument on "Old Baldy," a big lone mountain west of Dillon, Mont., near Polaris mine. Very prominent.

Station mark: The monument.

[Latitude 45° 21′ 23.50″. Longitude 113° 01′ 31.98″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Brenner	12 53 43.00	192 48 09.00	4.66577	28.782
Bloody Dick	46 02 18.00	225 49 40.00	4.51056	20.132

RUBY, BEAVERHEAD COUNTY, MONT.

A low partly timbered hill grassy on top and on east slope. One of first hills west of Big Hole Valley lying between the wagon roads from Gibbonsville, Idaho, to Wisdom, Mont., and the new Forest Service interstate road from the Bitter Root Valley to the Big Hole Valley. About 6 miles south of the Battle Grounds. Easily reached from the Gibbonsville road. The hill commands a fine view of the entire Big Hole Valley.

Station mark: A tablet set in big bowlder buried flush with ground under a large monument and quadripod signal.

Reference mark: A chiseled cross on rock set 14.03 feet north.

[Latitude 45° 35′ 02.83″. Longitude 113° 44′ 51.49″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Big Hole Pass	52 17 16.00	232 13 56.00	3.88587	4.778
Rocky	93 08 38.00	272 55 29.00	4.37965	14.894
Johnson	185 35 12.00	5 36 44.00	4.45356	17.657

SADDLE MOUNTAIN, RAVALLI COUNTY, MONT.

On the east knob of Saddle Mountain, on a side ridge about 1 mile north of the Idaho-Montana boundary line, visible from and 12 miles south of Sula, Mont. Easily reached by State-line trail by going west 3 miles from the pass through which the old snow road from the Bitter Root Valley to Salmon River goes.

Station mark: A chiseled cross on solid rock under a rock monument and tree signal.

Reference mark: A tablet set in solid rock 23.95 feet east.

[Latitude 45° 43′ 06.60″ Longitude 113° 58′ 59.47″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Rocky	22 07 09.50	202 04 06.24	4.1687967	9.165
Piquett	95 36 34.32	275 27 40.64	4.2093231	10.062
Trapper	128 11 34.02	307 58 04.36	4.4910654	19.249
Deer	170 52 40.84	350 49 37.25	4.5402883	21.559
Kent	200 52 37.45	21 00 47.81	4.6147950	25.594
Shirley	201 47 56.74	21 52 01.20	4.2966486	12.303
County line	235 47 33.55	56 07 41.73	4.6422064	27.262

SHIRLEY, RAVALLI COUNTY, MONT.

On the highest point of a hill at the south edge of thick timber with grassy ridges to the south. The hill is locally known as Shirley Hill and is about 3 miles east and visible from Sula post office. It is easily reached by wood road from Sula via Thompson's ranch. Water and grass near station at Thompson's ranch.

Station mark: Chiseled cross on placed rock under a small rock pile and quadripod signal.

Reference mark: A bronze tringulation tablet cemented in solid rock 45.2 feet south.

[Latitude 45° 53′ 01.88″. Longitude 113° 53′ 18.49″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Saddle	21 52 01.20	201 47 56.74	4.2966486	12.303
Deer	141 04 18.27	320 57 09.33	4.3101738	12.692
County line	258 49 01.06	78 05 06.01	4.4713759	18.396

SOUTH PYRAMID, BEAVERHEAD COUNTY, MONT. (Not occupied.)

The south one of two pyramid-shaped peaks about 6 miles apart and east of the Continental Divide, but considerably higher. The Black Horse mine is somewhere south of peak.

[Latitude 45° 18′ 42.18″. Longitude 113° 40′ 35.36″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Sal	21 39 46.00	201 32 43.00	4.54868	21.980
Bloody Dick	302 07 06.00	122 22 12.00	4.51723	20.445

SULA PEAK, RAVALLI COUNTY, MONT. (Not occupied.)

On sharp peak south end of timbered ridge about 2 miles west of Sula post office.

Station mark: Dead tree.

[Latitude 45° 51′ 38.30″. Longitude 113° 59′ 55.59″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Shirley	253 11 18.00	73 16 03.00	3.9515	5.555
Saddle	335 36 26.00	175 37 06.00	4.19987	9.845

TORREY MOUNTAIN, BEAVERHEAD COUNTY, MONT. (Not occupied.)

A very high peak of that name west of Dillon, Mont.

Station mark: Rock monument.

[Latitude 45° 27′ 23.59″. Longitude 112° 58′ 18.95″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Brenner	14 31 03.00	194 23 13.00	4.76430	36.112
Bloody Dick	39 20 40.00	219 05 44.00	4.63786	26.991

TRAPPER, RAVALLI COUNTY, MONT.

On the highest peak, called Trapper Peak, in the Bitter Root Range, about 15 miles southwest of Darby, Mont. Easily reached from the ridge to the southeast. The best route is to leave the wagon road up South Fork of Bitter Root River at Fuller's ranch at the mouth of Boulder Creek, 1 mile north of South Fork bridge, and follow up the long ridge dividing the waters of Boulder Creek and the main river. Good camping grounds at timber line about half a mile from peak and 1,000 feet lower.

Station mark: A chiseled hole in slanting solid rock under center of a big monument.

Reference mark: A bronze triangulation tablet set in solid rock.

[Latitude 45° 53′ 25.46.″ Longitude 114° 17′ 48.74″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Blue Nose	5 49 10.48	185 46 34.85	4.6683359	28.953
356	46 38 15.97	226 28 11.38	4.3992043	15.580
Ward (2)	181 42 32.18	01 43 03.26	4.4923012	19.304
Deer	231 04 00.18	51 14 28.10	4.3829476	15.007
Kent	243 25 23.35	63 47 06.48	4.6390032	27.062
Saddle	307 58 04.36	128 11 34.02	4.4910654	19.249
Rocky	329 58 41.61	150 09 06.90	4.5777112	23.500
Piquett	334 40 21.98	154 44 57.28	4.2879001	12.057

WYOMING.

TRIANGULATION STATIONS.

Como Ridge quadrangle.

CARBON COUNTY.

During the season of 1915 triangulation was extended northeastward by George T. Hawkins, from two stations of the United States Geological Survey, Elk and Rock, described in Bulletin 245, in order to control the northeast quarter of the Widdowfield 30′ quadrangle.

One old station, Rock, was occupied and the other one, Elk, sighted from three new stations and two stations cut in from three primary stations. Positions are on approximate North American datum.

COMO, CARBON COUNTY, WYO.

In sec. 17, T. 22 N., R. 77 W., about 7 miles east of Medicine Bow, on a high, bold ridge locally known as Como Ridge. This station can be reached by driving east along the railroad from Medicine Bow to a point where the road bends sharp toward the south, then follow a dim trail on the south side of the ridge for a mile when one drives up to the station. The station is nearly due south of the east end of Como Lake.

Signal: Tripod of sawed lumber.

Station mark: Tablet in solid rock.

Reference marks: (1) Arrowhead cut in rock, distant 9.9 feet north, 60° east. (2) Arrowhead cut in rock distant 24.3 feet west.

[Latitude 41° 53′ 05.70″. Longitude 106° 03′ 32.51″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Rock	21 06 04.50	200 59 19.99	4.5924583	24.311
Pine	41 41 58.33	221 37 32.12	4.1415286	8.608
Derrick	49 25 02	229 17 23	4.32168	13.033
Tank	96 52 15	276 46 40	4.06681	7.248
Flat	136 46 08.71	316 41 16.99	4.1665121	9.117

DERRICK, CARBON COUNTY, WYO. (Not occupied.)

A tall oil derrick about 12 miles southwest of Medicine Bow on high ground about 1½ miles north of the Medicine Bow River, in Carbon County.

Signal: Oil derrick.

Station mark: Oil well.

[Latitude 41° 45′ 42.88″. Longitude 106° 15′ 01.99″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Como	229 17 23	49 25 02	4.32168	13.033
Pine	243 40 53	63 44 06	3.87402	4.649
Rock	355 16 12	175 17 02	4.36045	14.250

ELK, CARBON COUNTY, WYO.

A high dome-shaped mountain about 15 miles south of Hanna and about 10 miles west of Elk Mountain post office. The mountain is precipitous with much down timber, making ascent difficult. The most practicable route is from Rattlesnake Pass on northwest side. At one time there was a trail along this route, but at present only traces are found at intervals. Time required to ascend peak, 6 hours. Summit is above timber line and consequently bald.

Station mark: A cairn about 5 feet in diameter at base and about 6 feet high.

Reference mark: A bronze triangulation tablet cemented in solid rock.

True azimuth from station mark, 198° 19′ 22″.

Distance, 13.1 feet.

[Latitude 41° 37′ 59.46″. Longitude 106° 31′ 31.76″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Flat	216 28 25.02	36 42 13.45	4.6823858	29.904
Pine	239 07 36.35	59 21 48.15	4.5370357	21.399

FLAT, CARBON COUNTY, WYO.

In sec. 9, T. 23 N., R. 78 W., on the west end of a hill locally known as Flat Top, and about 1 mile east and 6 miles north of Medicine Bow. The road from Medicine Bow to the T-B ranch passes close to the east end of the hill and one can drive to within 100 yards of the station.

Signal: Sawed lumber tripod.

Station mark: Survey tablet in solid rock.

Reference marks: (1) Arrowhead chiseled in solid rock pointing to center is 13.5 feet northeast. (2) Arrowhead pointing to center chiseled in solid rock is 15½ feet south 30° west.

[Latitude 41° 58′ 51.97″. Longitude 106° 10′ 49.06″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Rock	4 48 25.74	184 46 31.64	4.6754542	29.431
Tank	9 15 56	189 15 12	3.97398	5.853
Elk	36 42 13.45	216 28 25.02	4.6823858	29.904
Como	316 41 16.99	136 46 08.71	4.1665121	9.117
Pine	357 38 45.00	177 39 10.00	4.3232526	13.080

MEDICINE BOW TANK, CARBON COUNTY, WYO. (Not occupied.)

A water tank 110 feet high, completed in July, 1915, and used for city water supply in Medicine Bow, Carbon County.

Signal: Center of tank.

Station mark: Center of tank.

[Latitude 41° 53′ 50.64″. Longitude 106° 11′ 54.84″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Flat	189 15 12	9 15 56	3.97398	5.853
Como	276 46 40	96 52 15	4.06681	7.248
Pine	348 31 21	168 32 30	4.07830	7.441

PINE, CARBON COUNTY, WYO.

Near the west end of ridge where it breaks off in steep bluff, in sec. 16, T. 21 N., R. 78 W. The station is nearly on a line with a wire fence running north and south to the south of the ridge. The station can be reached by wagon, going about 10 miles from Medicine Bow on the Arlington road, then drive to near the top from the south side of ridge.

Signal: Poles and plank.

Station mark: Tablet set in sandstone.

Reference marks: (1) Arrow pointing to center, east, distance 14 feet. (2) Arrow pointing to center S. 70° W. distant 21 feet.

[Latitude 41° 47′ 30.27″. Longitude 106° 10′ 11.61″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Rock	10 28 25.66	190 26 06.88	4.4250210	16.534
Elk	59 21 48.15	239 07 36.35	4.5370357	21.399
Derrick	63 44 06	243 40 53	3.87402	4.649
Tank	168 32 30	348 31 21	4.07830	7.441
Flat	177 39 10.00	357 38 45.00	4.3232526	13.080
Como	221 37 32.12	41 41 58.33	4.1415286	8.608

ROCK, CARBON COUNTY, WYO.

About 3 miles south of Arlington post office and 1.5 miles east of Rock Creek. The point locally known as Rock Mountain was cleared of timber and a quadripod signal erected on highest point. Can be reached with pack outfit by blind trail from Arlington. On account of windfalls this point is difficult of approach except by trail.

Station mark: A bronze triangulation tablet cemented in solid rock.

[Latitude 41° 33′ 22.12″. Longitude 106° 13′ 40.34″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Derrick	175 17 02	355 16 12	4.36045	14.250
Flat	184 46 31.64	4 48 25.74	4.6754542	29.431
Pine	190 26 06.88	10 28 25.66	4.4250210	16.534
Como	200 59 19.99	21 06 04.50	4.5924583	24.311

ILLINOIS.

PRIMARY TRAVERSE.

Augusta, Beardstown, Camp Point, Liberty, Mendon, Meredosia, Mount Sterling, Quincy, Rushville, and Vermont quadrangles.

ADAMS, BROWN, HANCOCK, AND SCHUYLER COUNTIES.

The following geographic positions on approximate North American datum were determined by E. L. McNair in 1914. They are based upon La Grange and Quincy Courthouse, triangulation points of the United States Corps of Engineers, and also on primary traverse positions of the United States Geological Survey in Colchester and Macomb quadrangles. The latter are described in Bulletins 496 and 551.

AUGUSTA QUADRANGLE.

Along highways near east border of north half of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 2 N., R. 3 W., in W. ½ sec. 20, 35 feet northeast of intersection of crossroads; iron post stamped "Prim. Trav. Sta. No. 13, 1914, Illinois"	40 08 30.4	90 46 14.9	.....
T. 2 N., R. 3 W., corner of secs. 7, 8, 17, and 18; center of north and south road at	40 09 49.4	90 46 30.5	8,086
T. 2 N., R. 3 W., corner of secs. 5, 6, 7, and 8; T road west	40 10 41.7	90 46 29.2	5,300
T. 2 N., R. 3 W., north corner of secs. 5 and 6	40 11 35.4	90 46 28.0	5,431
T. 3 N., R. 3 W., corner of secs. 29, 30, 31, and 32; center of north and south road	40 12 27.0	90 46 24.6	5,240
T. 3 N., R. 3 W., quarter corner between secs. 29 and 30; T road west	40 12 53.4	90 46 24.2	2,670
T. 3 N., R. 3 W., corner of secs. 19, 20, 29, and 30; center of roads north and east	40 13 19.2	90 46 23.8	2,610
Brooklyn, west side of schoolhouse square, 30 feet east of intersection of Kentucky Street and Broadway; iron post stamped "Prim. Trav. Sta. No. 57, 1910, Illinois"	40 13 32.6	90 45 48.8	3,042

Along highways near east border of south half of quadrangle.

Forks of road, 20 feet west to oak tree in fence line	40 07 40.9	90 46 16.8	.....
Little Missouri Creek; center of iron span bridge over	40 07 09.7	90 46 00.7	3,396
T. 2 N., R. 3 W., in middle of sec. 32; T road east	40 06 45.1	90 46 00.9	2,497
Brown-Schuyler county line, at crossing of the Mount Sterling-Camden public road	40 06 18.7	90 46 06.1	2,711
T road east	40 05 29.4	90 46 01.9	4,995
T. 1 N., R. 3 W., quarter corner between secs. 8 and 17; T road east	40 04 30.7	90 46 02.9	5,951
Daisy, 0.25 mile west of store at; T road east	40 03 48.7	90 46 03.8	4,252
T road east	40 03 15.3	90 46 04.4	3,390
T. 1 N., R. 3 W., at quarter corner between secs. 20 and 29; T road west	40 02 45.6	90 46 05.3	3,010
T. 1 N., R. 3 W., at quarter corner between secs. 29 and 32; T road west	40 01 53.0	90 46 06.7	5,329
Tps. 1 N. and 1 S., R. 3 W., approximately at quarter corner between secs. 5 and 32; crossroads	40 01 00.3	90 46 06.8	5,330
T. 1 S., R. 3 W., quarter corner between secs. 5 and 8, fence line east; center of north and south road	40 00 08.0	90 46 06.4	5,297

AUGUSTA QUADRANGLE—Continued.

Along highways near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 1 S., R. 4 W., corner of secs. 4, 5, 8, and 9, 20 feet east and 3 feet north of stone at, is T road west	40 00 10.9	90 52 24.6	.....
Timewell, 0.25 mile south and 0.5 mile west of, 25 feet north and 45 feet east of T road north at quarter corner between secs. 5 and 8, T. 1 S., R. 4 W., 18 feet east of corner fence post; iron post stamped "Prim. Trav. Sta. No. 15, 1914, Illinois"	40 00 11.5	90 52 58.7	2,656
T. 1 S., R. 4 W., corner of secs. 5, 6, 7, and 8; center of east and west road at north and south fences	40 00 11.6	90 53 33.6	2,710
T road north	40 00 12.4	90 54 25.1	4,011
Tps. 1 S. and 1 N., on north side of sec. 6, R. 4 W.; center of road at T road south	40 01 04.9	90 54 31.4	5,343
Tps. 1 N. and 1 S., Rs. 4 and 5 W.; center of east and west road at wire fence south, on Brown-Adams county line	40 01 05.1	90 54 52.2	1,620
Tps. 1 N. and 1 S., R. 5 W., corner of secs. 35, 36, 1, and 2; T road north	40 01 05.6	90 56 01.8	5,410
Tps. 1 N. and 1 S., R. 5 W., quarter corner between secs. 2 and 35; T road south	40 01 05.8	90 56 35.5	2,620
T. 1 S., R. 5 W., north corner of secs. 2 and 3; T road south (130 feet west of above corner is south corner of secs. 34 and 35, T. 1 N., R. 5 W.)	40 01 06.1	90 57 09.3	2,630
T. 1 S., R. 5 W., quarter corner on north side of sec. 3; T road south, 140 feet west of above is south corner of sec. 34, T. 1 N., R. 5 W	40 01 06.4	90 57 44.3	2,720
T. 1 S., R. 5 W., north corner of secs. 3 and 4; center of east and west road at fence south (210 feet west is south corner of secs. 33 and 34, R. 5 W., center east and west road at hedge north)	40 01 06.6	90 58 17.9	2,620
T. 1 N., R. 5 W., south corner of secs. 32 and 33; T road north	40 01 07.0	90 59 30.8	5,665

Along highways through center of quadrangle.

T. 1 N., R. 5 W., quarter corner between secs. 20 and 29; T road north	40 08 07.7	90 59 55.1	.....
T. 1 N., R. 5 W., corner of secs. 20, 21, 28, and 29, hedge line north; T road south	40 08 07.0	90 59 20.8	2,660
T. 1 N., R. 5 W., quarter corner between secs. 21 and 28, fence south; T road north	40 08 06.3	90 58 46.6	2,660
T. 1 N., R. 5 W., corner of secs. 21, 22, 27, and 28; T road north	40 08 05.7	90 58 12.3	2,661
T. 1 N., R. 5 W., quarter corner between secs. 22 and 27; T road south	40 08 05.0	90 57 38.0	2,670
T. 1 N., R. 5 W., corner of secs. 22, 23, 26, and 27; center of east-west road at fence line south	40 08 04.3	90 57 03.3	2,690
T. 1 N., R. 5 W., quarter corner between secs. 23 and 26; center of crossroads	40 08 03.4	90 56 28.8	2,680
T. 1 N., R. 5 W., corner of secs. 23, 24, 25, and 26, at hedge line south; T road north	40 08 02.9	90 55 54.3	2,680
T. 1 N., Rs. 4 and 5 W., east corner of secs. 24 and 25, in line with roads north and west (west corner of secs. 19 and 30 in T. 1 N., R. 4 W., not determined; road north on Adams-Schuyler county line)	40 08 01.8	90 54 46.5	5,270
T. 1 N., R. 4 W., quarter corner between secs. 19 and 30; T road south	40 08 00.9	90 54 14.0	2,526
T. 1 N., R. 4 W., 20 feet south and 20 feet east of center of cross-roads, at quarter corner between secs. 20 and 29, 5 feet east of corner fence post; iron post stamped "Prim. Trav. Sta. No. 18, 1914, Illinois"	40 08 01.4	90 52 52.1	6,356
T. 1 N., R. 4 W., quarter corner between secs. 20 and 21; cross-roads	40 08 28.2	90 52 17.5	3,818
T. 1 N., R. 4 W., center of sec. 21; T road north	40 08 28.4	90 51 42.8	2,690
T. 1 N., R. 4 W., quarter corner between secs. 21 and 22; T road north	40 08 28.8	90 51 08.1	2,700
T. 1 N., R. 4 W., center of sec. 22; public crossroads	40 08 29.0	90 50 34.1	2,640
T. 1 N., R. 4 W., quarter corner between secs. 22 and 23, center of east-west road, fence north, hedge south	40 08 29.5	90 50 00.1	2,640
T. 1 N., R. 4 W., quarter corner between secs. 23 and 24	40 08 31.3	90 48 52.4	5,258
T. 1 N., R. 4 W., in SE. ¼ sec. 24; T road south	40 08 25.9	90 48 01.2	4,012
T. 1 N., Rs. 3 and 4 W., quarter corner between secs. 19 and 24, near junction of east and west fence line and fence north	40 08 32.1	90 47 44.1	1,470
T. 1 N., R. 3 W., quarter corner between secs. 19 and 20; center of east-west road at north and south fences	40 08 30.5	90 46 32.6	5,555

Magnetic declination for north border of quadrangle, 5° 39′ E.; for south border, 5° 31′ E.; for east border, 5° 28′ E.; for west border, 5° 39′ E.; for center, 5° 55′ E.

BEARDSTOWN QUADRANGLE.

Along highways near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 1 N., R. 1 W., corner of secs. 14, 15, 22, and 23; roads north and west	40 03 26.0	90 29 30.7	
T road south, near cemetery; center of triangle at	40 03 51.8	90 29 30.4	2,615
T. 1 N., R. 1 W., in east part of sec. 10; T road west	40 04 47.8	90 29 46.6	5,811
T. 1 N., R. 1 W., corner of secs. 2, 3, 10, and 11; roads south and east	40 05 13.2	90 29 29.6	2,885
T. 1 N., R. 1 W., in east part of sec. 3; T road west	40 05 39.9	90 29 46.9	3,018
T. 2 N., R. 1 W., corner of secs. 2, 3, 10, and 11; T road west	40 10 31.4	90 29 24.7	
Tps. 2 and 3 N., quarter corner on north side of sec. 2	40 11 21.6	90 28 49.8	5,765
Ray station, 100 feet east of; public road crossing Burlington R. R. at	40 12 22.4	90 28 30.1	6,342
T road corners, roads east, west, and north	40 12 40.0	90 29 00.4	2,950
T. 3 N., R. 1 W., in E. ½ sec. 22; T road west	40 13 31.0	90 29 41.4	6,066
Iron bridge; center of	40 13 53.4	90 29 33.8	2,340
T. 3 N., R. 1 W., quarter corner between secs. 11 and 14; center of north and south road	40 14 51.0	90 28 46.6	6,885

Magnetic declination for west border of quadrangle, 5° 25′ E.

CAMP POINT QUADRANGLE.

Along highways near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 1 S., R. 5 W., quarter corner on north side of sec. 5; T road south.	40 01 07.3	91 00 02.6	
T. 1 N., R. 5 W., south corner of secs. 31 and 32, 25 feet south of T road north at, 2 feet north of fence line; iron post stamped "Prim. Trav. Sta. No. 16, 1914, Illinois"	40 01 07.3	91 00 40.6	2,956
T. 1 N., R. 5 W., quarter corner between secs. 31 and 32; public crossroads	40 01 34.2	91 00 40.0	2,724
T. 1 N., R. 5 W., near corner secs. 29, 30, 31, and 32; Wabash R. R. crossing	40 02 00.7	91 00 38.9	2,674
T. 1 N., R. 5 W., quarter corner between secs. 29 and 30; public crossroads	40 02 27.2	91 00 38.0	2,600
T. 1 N., R. 5 W., corner of secs. 19, 20, 29, and 30; T road west	40 02 53.9	91 00 37.1	2,700
T. 1 N., R. 5 W., corner of secs. 17, 18, 19, and 20; center of north and south road at hedge east and fence west	40 03 46.4	91 00 35.2	5,321
T. 1 N., R. 5 W., quarter corner between secs. 17 and 18; public crossroads	40 04 12.8	91 00 33.4	2,665
T. 1 N., R. 5 W., corner of secs. 7, 8, 17, and 18; public crossroads at Union Schoolhouse	40 04 39.2	91 00 33.5	2,675
T. 1 N., R. 5 W., corner of secs. 5, 6, 7, and 8; T road east	40 05 31.7	91 00 31.6	5,320
T. 1 N., R. 5 W., north corner of secs. 5 and 6; granite bowlder on north side of east and west road (150 feet west of above corner is south corner of secs. 31 and 32, T. 2 N., R. 5 W., center of east and west road on township line)	40 06 22.3	91 00 29.8	5,122
T. 2 N., R. 5 W., corner of secs. 29, 30, 31, and 32; crossroads	40 07 15.7	91 00 30.6	5,399
Burlington R. R., 100 feet northeast of road crossing; center line of north and south road	40 07 46.4	91 00 29.9	3,110
T. 2 N., R. 5 W., 25 feet west by 23 feet south of crossroads at corner of secs. 19, 20, 29, and 30, 4 feet southeast of corner fence post; iron post stamped "Prim. Trav. Sta. No. 17, 1914, Illinois"	40 08 08.1	91 00 29.7	2,198
T. 2 N., R. 5 W., corner of secs. 17, 18, 19, and 20; center of north and south road in line with center of road west on section line	40 09 01.3	91 00 28.3	5,390
T. 2 N., R. 5 W., corner of secs. 5, 6, 7, and 8; public crossroads at schoolhouse	40 10 46.7	91 00 26.7	10,661
T. 3 N., R. 5 W., south corner of secs. 31 and 32, stone near center of east and west road, in line with road north, on Adams-Hancock county line (190 feet east of above corner is north corner of secs. 5 and 6, T. 2 N., R. 5 W., granite stone in center of east and west road in line with T road south)	40 11 39.0	91 00 28.3	5,291
T. 3 N., R. 5 W., corner of secs. 29, 30, 31, and 32, center of north and south road at fence line east and T road west	40 12 30.9	91 00 27.4	5,256
T. 3 N., R. 5 W., quarter corner of secs. 29 and 30, hedge line west, T road east	40 12 58.2	91 00 26.9	2,770
T. 3 N., R. 5 W., corner of secs. 19, 20, 29, and 30, fence line east, T road west	40 13 24.7	91 00 26.4	2,680

CAMP POINT QUADRANGLE—Continued.

Along highway near east border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 3 N., R. 5 W., quarter corner between secs. 19 and 20; public road crossing	40 13 51.3	91 00 26.0	2,690
T. 3 N., R. 5 W., corner of secs. 17, 18, 19, and 20; stone in center of north and south road at fence east and west	40 14 17.8	91 00 25.6	2,680
T. 3 N., R. 5 W., quarter corner between secs. 17 and 18, at hedge line east; T road west	40 14 44.2	91 00 25.0	2,679
T. 3 N., R. 5 W., 40 feet northeast of stone at corner of secs. 7, 8, 17, and 18, at corner of hedge in northeast corner of T road east; iron post stamped "Prim. Trav. Sta. No. 55, 1910, Illinois"	40 15 11.0	91 00 24.1	2,713

Along highways near south border of quadrangle.

Tps. 1 N. and 1 S., Rs. 5 and 6 W.; stone in southwest corner of yard	40 01 08.0	91 01 50.6	.....
T. 1 S., R. 6 W., quarter corner between secs. 1 and 2; T road east.	40 00 41.4	91 02 56.9	5,818
T. 1 S., R. 6 W., quarter corner between secs. 2 and 3; T road east.	40 00 42.8	91 04 04.8	5,286
Road forks; center of north and south road at northeast corner of triangle	40 00 11.1	91 04 23.0	3,510
McKees Creek, north and south branch of; center of iron truss bridge over	40 00 08.0	91 04 51.8	2,263
T. 1 S., R. 6 W., on line between secs. 9 and 10; center of east and west road, fences north and south	40 00 05.2	91 05 13.0	1,678
T. 1 S., R. 6. W., in northeast quarter of sec. 9; T road east	40 00 04.3	91 05 30.3	1,345
T. 1 S., R. 6 W., 0.25-mile west of corner of secs. 3, 4, 9, and 10, on line between secs. 4 and 9; T road south	40 00 17.9	91 05 30.1	1,370
T. 1 S., R. 6 W., corner of secs. 4, 5, 8, and 9, east and west road in line with fence north from back of school yard	40 00 18.5	91 06 21.6	4,000
McKees Creek; center of iron bridge over	40 00 31.7	91 07 24.0	5,034
T. 1 S., R. 6 W., stone at quarter corner of secs. 6 and 7, roads south and east, fences north and west	40 00 20.7	91 08 03.8	3,294
T. 1 S., R. 7 W., corner of secs. 3, 4, 9, and 10; T road west, hedge line east	40 00 22.1	91 12 15.9	.....
T. 1 S., R. 7 W., corner of secs. 4, 5, 8, and 9; T road north, hedge line south	40 00 23.2	91 13 24.5	5,340
T. 1 S., R. 7 W., quarter corner between secs. 5 and 8; T road south, hedge line north	40 00 23.7	91 13 59.1	2,690
T. 1 S., R. 7 W., corner of secs. 5, 6, 7, and 8; center of east and west road at north and south hedge line	40 00 24.1	91 14 33.7	2,690

Magnetic declination for east border of quadrangle, 5° 39′ E.; for south border, 6° 12′ E.

LIBERTY QUADRANGLE.

Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 1 S., Rs. 6 and 7 W., corner of secs. 12, 13, 7, and 18; stone in north and south road	39 59 28.8	91 08 51.9	.....
T. 1 S., Rs. 6 and 7 W., about 380 feet south by 825 feet west of corner of secs. 12, 13, 7, and 18, at southwest corner of angle in road; iron post stamped "Prim. Trav. Sta. No. 19, 1914, Illinois"	39 59 25.0	91 09 02.5	912
T. 1 S., R. 7 W., corner of secs. 11, 12, 13, and 14; center of crossroads.	39 59 29.2	91 09 59.8	4,478
T. 1 S., R. 7 W., quarter corner between secs. 11 and 14; T road north	39 59 29.2	91 10 33.6	2,630
T. 1 S., R. 7 W., corner of secs. 10, 11, 14, and 15; T road south, hedge line north	39 59 29.3	91 11 07.4	2,630
T. 1 S., R. 7 W., quarter corner between secs. 10 and 15, 10 feet east to hedge south; T road north	39 59 29.2	91 11 41.2	2,630
T. 1 S., R. 7 W., center of sec. 10; crossroads	39 59 55.8	91 11 41.6	2,690

Magnetic declination for north border of quadrangle, 6° 12′ E.

MENDON QUADRANGLE.

Along highways near southeast corner of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Chicago, Burlington & Quincy R. R.; public road crossing	40 00 24.5	91 15 18.9	.....
T. 1 S., Rs. 7 and 8 N., 35 feet south by 15 feet west of T road south at, 150 feet north of railroad crossing west of Fowler, 8 feet south of corner fence post; iron post stamped "Prim. Trav. Sta. No. 20, 1914, Illinois"	40 00 24.6	91 15 46.4	2,142
T. 1 S., R. 8 W., on line between secs. 11 and 12; north and south road crossing	40 00 05.5	91 16 54.1	5,606

Magnetic declination near southeast corner of quadrangle, 6° 24′ E.

MEREDOSIA QUADRANGLE.

Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
La Grange triangulation station, situated at apex of an Indian mound, at the top of river bluff, 1 mile south of La Grange Landing, 600 feet southwest of dwelling house owned by John Prudence, 2,004 feet north by 258 feet east of southwest corner of sec. 32, T. 1 S., R. 1 W., established in March, 1903; station mark stone and pipe	39 55 54.754	90 32 51.572	.....
La Grange, 60 feet south of gate to yard in front of residence; cross-roads	39 56 49.4	90 32 12.5	6,317
T road north	39 58 10.2	90 32 42.3	8,498
T road corners; roads east, west, and north	39 58 36.4	90 33 55.3	6,269
Crooked Creek; center of iron truss bridge over	39 58 48.1	90 34 55.7	4,850
T. 1 S., R. 2 W., on line between secs. 12 and 13; crossroads	39 59 07.6	90 34 55.5	1,974
Crossroads	39 59 33.5	90 34 55.2	2,620
T. 1 S., R. 2 W., center of sec. 12; T road south	39 59 34.1	90 34 37.5	1,383
T. 1 S., Rs. 1 and 2 W.; center of east and west road, at lane north to house	39 59 35.2	90 34 02.3	2,744
T. 1 S., R. 1 W., quarter corner between secs. 7 and 8, in line with road north; center of east and west road	39 59 35.3	90 32 53.6	5,350
T. 1 S., R. 1 W., quarter corner between secs. 8 and 9; T road south	39 59 34.9	90 31 45.6	5,290
Green Creek; center of iron bridge over	39 59 36.0	90 31 12.2	2,604
T. 1 S., R. 3 W., on line between secs. 15 and 16; center of east and west road at T road south	39 58 59.9	90 44 25.1	.....
T. 1. S., R. 3 W., in northeast corner of sec. 15; public crossroads	39 59 02.3	90 43 32.6	4,089
T. 1 S., R. 3. W., on line between secs. 13 and 14; road crossing	39 59 01.0	90 42 03.3	6,957
T. 1 S., Rs. 2 and 3 W.; center of east and west road at road south	39 58 59.9	90 40 37.4	6,678
T. 1. S., R. 2 W., in northwest quarter of sec. 17; center of small iron bridge	39 58 56.3	90 39 42.7	4,277
T. 1 S., R. 2 W., at quarter corner between secs. 16 and 17; cross-roads	39 58 42.7	90 38 39.9	5,077
T. 1 S., R. 2 W., near center of sec. 16, about 15 feet south of east and west road, in line with road north and fence line south, on bank 3 feet above road, 35 feet southwest of elm tree, in triangle between roads; iron post stamped "Prim. Trav. Sta. No. 9, 1914, Illinois"	39 58 41.9	90 38 04.7	2,736
T road south	39 58 41.8	90 37 47.0	1,369
T. 1 S., R. 2 W., in sec. 15; center of small iron bridge	39 58 30.3	90 37 04.5	3,513
T. 1 S., R. 2 W., quarter corner between secs. 15 and 22; center of north and south road	39 58 15.3	90 36 55.3	1,681
T. 1 S., R. 2 W., over small branch of Crooked Creek; center of small wooden bridge	39 58 38.3	90 35 22.0	7,621

Magnetic declination for north border of quadrangle, 5° 27′ E.

MOUNT STERLING QUADRANGLE.

Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 1 S., R. 3 W., about 0.25 mile north of quarter corner between secs. 8 and 17, 820 feet north of street in Mount Sterling, on Mount Sterling-Camden road, 35 feet west of center of north and south road, 2 feet east of wire fence on bank opposite frame cottage on east side of road; iron post stamped "Prim. Trav. Sta. No. 14, 1914, Illinois"	39 59 29.1	90 46 07.2	.....
Mount Sterling, on west side of, on Quincy road; crossroads	39 59 15.6	90 46 24.0	1,889
T. 1 S., R. 3 W., corner of secs. 7, 8, 17, and 18; center of east and west road at north and south fences	39 59 15.7	90 46 40.7	1,300
Wabash R. R.; public road crossing	39 59 15.8	90 46 55.5	1,150
T. 1 S., R. 3 W., west corner of secs. 7 and 18 (40 feet north of above corner is east corner of secs. 12 and 13, T. 1 S., R. 4 W., cross-roads north and south)	39 59 16.2	90 47 48.4	4,120
T. 1 S., R. 4 W., center of sec. 12; T road forks	39 59 43.5	90 48 24.1	3,918
T. 1 S., R. 4 W., center of sec. 11; public crossroads at school-house	39 59 44.1	90 49 32.6	5,330
T. 1 S., R. 4 W., center of sec. 10; T road north	39 59 43.8	90 50 41.6	5,370
T. 1 S., R. 4 W., at quarter corner between secs. 8 and 9; T road east	39 59 44.4	90 52 24.9	8,039

Magnetic declination for north border of quadrangle, 5° 31′ E.

QUINCY QUADRANGLE.

Along Chicago, Burlington & Quincy R. R. in northern part of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 1 S., R. 8 W., on line between secs. 11 and 14; crossing of east and west road	39 59 35.1	91 17 49.0	.....
T. 1 S., R. 8 W., crossing of north and south road between secs. 14 and 15	39 59 25.5	91 18 02.6	1,436
Eubanks siding; center of railroad track opposite switch stand at east end of	39 58 59.8	91 18 39.2	3,855
T. 1 S., R. 8 W., corner of secs. 15, 16, 21, and 22; T road north	39 58 42.5	91 19 10.8	3,014
Eubanks, west end of siding near; center of tracks opposite switch stand	39 58 14.8	91 19 36.8	3,460
T. 1 S., R. 8 W., corner of secs. 19, 20, 29, and 30; T road north	39 57 52.1	91 21 28.2	8,972
T. 1 S., R. 8 W., center of sec. 30; east and west road crossing	39 57 26.4	91 22 03.1	3,770
T. 1 S., Rs. 8 and 9 W., on line between secs. 25 and 30; north and south road crossing	39 57 20.4	91 22 38.6	2,824
Quincy; center of intersection of North Seventh Street and Elm Street	39 56 26.5	91 24 16.7	9,386
Quincy; center of tower on courthouse	39 56 06.57	91 24 26.77	2,166

Magnetic declination near Quincy, 6° 32′ E.

RUSHVILLE QUADRANGLE.

Along highways near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Tps. 1 N. and 1 S., R. 1 W., near quarter corner of secs. 3 and 34, 66 feet east of north and south road on west side of levee, on top of levee, in line with road west, on township line; iron post stamped "Prim. Trav. Sta. No. 10, 1914, Illinois"	40 00 40.2	90 30 05.0	.....
T road corners, roads north, south, and west	40 01 14.0	90 30 08.7	3,436
Drainage canal; center pier of double span truss bridge	40 01 42.7	90 30 08.8	2,907
T. 1 N., R. 1 W., quarter corner between secs. 22 and 27; a stone 390 feet north of crossroads, 20 feet east of road	40 02 32.7	90 30 05.2	5,072
T road corners, roads east, west, and north	40 02 58.0	90 30 14.6	2,662
T. 1 N., R. 1 W., stone at quarter corner between secs. 3 and 34; road east on township line, road north 25 feet west of stone	40 06 06.7	90 30 01.2	2,931

RUSHVILLE QUADRANGLE—Continued.

Along highways near east border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 2 N., R. 1 W., quarter corner between secs. 27 and 34; center of north and south road at fence west	40 06 59.8	90 30 00.6	5,371
T. 2 N., R. 1 W., near center of sec. 27, 40 feet south of center of east and west road, 20 feet east of road south, about in line with road north, 10 feet south of corner fence post; iron post stamped "Prim. Trav. Sta. No. 11, 1914, Illinois"	40 07 25.8	90 30 00.3	2,632
T. 2 N., R. 1 W., quarter corner between secs. 22 and 27; T road south	40 07 52 6	90 30 00.0	2,710
T. 2 N., R. 1 W., quarter corner between secs. 21 and 22; roads east and north	40 08 19.4	90 30 33.9	3,779
T. 2 N., R. 1 W., corner of secs. 15, 16, 21, and 22; T road west	40 08 46.0	90 30 33.8	2,695
T. 2 N., R. 1 W., quarter corner between secs. 15 and 16; crossroads	40 09 12.4	90 30 33.7	2,680
T. 2 N., R. 1 W., on line between secs. 9 and 10; T road west	40 09 51.7	90 30 33.4	3,970

Along highways through center of quadrangle.

T. 2 N., R. 1 W., center of sec. 28; crossroads	40 07 26.6	90 31 08.6	.....
T. 2 N., R. 1 W., quarter corner between secs. 28 and 29	40 07 26.8	90 31 42.5	2,630
Iron bridge; center of	40 07 23.1	90 32 07.3	1,955
Rushville, street intersection; Presbyterian Church on southwest corner	40 07 26.1	90 33 43.8	7,501
Rushville station, 600 feet north of; road north	40 07 33.7	90 34 08.6	2,073
T road west	40 08 00.9	90 34 42.6	3,814
T. 2 N., R. 2 W., corner of secs. 13, 14, 23, and 24; T road south	40 08 47.5	90 35 07.3	5,089
T. 2 N., R. 2 W., quarter corner between secs. 14 and 23; crossroads	40 08 47.5	90 35 41.8	2,680
T. 2 N., R. 2 W., quarter corner between secs. 15 and 22; T road south	40 08 48.0	90 36 49.5	5,325
T. 2 N., R. 2 W., 35 feet east and 30 feet south of crossroads at corner of secs. 15, 16, 21, and 22, 2 feet north of fence line; iron post stamped "Prim. Trav. Sta. No. 12, 1914, Illinois"	40 08 48.0	90 37 23.7	2,580
T. 2 N., R. 2 W., on line between secs. 20 and 21; T road south	40 08 39.2	90 38 32.2	5,383
T. 2 N., R. 2 W., in sec. 20; T road east	40 08 33.1	90 39 06.6	2,744
T. 2 N., R. 2 W.; T road north	40 08 13.6	90 41 22.9	10,765
Crooked Creek; center of iron truss bridge over	40 08 03.8	90 41 53.2	2,546
T. 2 N., R 3 W., stone at quarter corner between secs. 23 and 26; roads south and west	40 08 00.7	90 42 32.5	3,070
T. 2 N., R. 3 W., stone at corner of secs. 22, 23, 26, and 27; T road east	40 08 01 2	90 43 07.2	2,694
Mabel store; T road west at	40 08 23.2	90 43 40.5	3,407
Mabel store, about 0.4 mile west of; T road south	40 08 27.2	90 44 06.1	2,024
Mabel store, about 0.7 mile west of; T road north	40 08 28.2	90 44 26.3	1,567

Magnetic declination for north border of quadrangle, 5° 37′ E.; for south border, 5° 27′ E.; for east border, 5° 25′ E.; for west border, 5° 28′ E.; for center, 5° 34′ E.

VERMONT QUADRANGLE.

On highway near southwest corner of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 3 N., R. 1 W., in center of sec. 11; crossroads	40 15 17 5	90 28 46.0	.....
T. 3 N., R. 1 W., quarter corner between secs. 10 and 11, 95 feet north and 18 feet east of, on east side of north-south road; iron post stamped "Prim. Trav. Sta. No. 48, Ill., 1911"	40 15 19.4	90 29 22.2	2,812

Good Hope, La Harpe, Lomax, Monmouth, and Oquawka quadrangles.

HANCOCK, HENDERSON, McDONOUGH, AND WARREN COUNTIES.

The following geographic positions upon North American datum were determined by E. L. McNair in 1914. They are based on positions given in Bulletins 496 and 551.

GOOD HOPE QUADRANGLE.

Along highways through center of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 7 N., R. 1 W., 30 feet north and 30 feet west of center of cross-roads, at corner secs. 3, 4, 9, and 10, in corner of schoolhouse yard, 6 feet north of corner fence post; iron post stamped "Prim. Trav. Sta. No. 16, 1912"	40 36 54.4	90 30 13.0	.....
T. 7 N., R. 1 W., corner secs. 4, 5, 8, and 9; center of crossroads	40 36 55.9	90 31 21.0	5,247
T. 7 N., R. 1 W., at center of T road south; north corner secs. 4 and 5 (85 feet west to south corner secs. 32 and 33, T. 8 N., R. 1 W., T road north)	40 37 47.1	90 31 20.3	5,180
T. 7 N., R. 1 W., north corner secs. 5 and 6; at T road south (110 feet west is south corner secs. 31 and 32, T. 8 N., R. 1 W., at hedge north)	40 37 48.6	90 32 28.9	5,289
Tps. 7 and 8 N., Rs. 1 and 2 W., corner secs. 1, 6, 31, and 36; cross-roads on Warren-McDonough county line	40 37 50.2	90 33 35.9	5,170
T. 7 N., R. 2 W., north corner secs. 1 and 2, at T road south, 170 feet east of south corner secs. 35 and 36, T. 8 N., R. 2 W.	40 37 51.2	90 34 42.9	5,170
T. 8 N., R. 2 W., south corner secs. 34 and 35, on Warren-McDonough county line, at north-south fence; center of east-west road	40 37 51.9	90 35 54.9	5,551
T. 7 N., R. 2 W., north corner secs. 3 and 4; at T road south (200 feet west to south corner secs. 33 and 34, T. 8 N., R. 2 W., T road north)	40 37 52.5	90 37 02.0	5,171
T. 8 N., R. 2 W., 15 feet north and 35 feet west of T road corners, apparently at south corner secs. 32 and 33, 15 feet west of corner fence post and 2 feet south of fence line; iron post stamped "Prim. Trav. Sta. No. 1, 1914, Ill."	40 37 53.4	90 38 14.8	5,620
T. 7 N., R. 2 W., at apparent north corner secs. 5 and 6; stone at T road south	40 37 53.6	90 39 20.6	5,070
T. 7 N., Rs. 2 and 3 W., north corner secs. 1 and 6; T road south (70 feet west of this point is T road north, at south corner secs. 31 and 36, T. 8 N., Rs. 2 and 3 W.)	40 37 53.9	90 40 22.4	4,760
T. 7 N., R. 3 W., at north corner secs. 1 and 2; T road south (240 feet west of this point is south corner secs. 35 and 36, T. 8 N., R. 3 W., T road north)	40 37 56.3	90 41 31.5	5,334
T. 7 N., R. 3 W., north corner secs. 2 and 3; T road south (140 feet west is south corner secs. 34 and 35, T. 8 N., R. 3 W., at T road north)	40 37 58.5	90 42 41.0	5,365
T. 8 N., R. 3 W., at T road north, south corner secs. 33 and 34	40 38 00.8	90 43 53.8	5,620

Along highways near north border of quadrangle.

T. 9 N., Rs. 2 and 3 W., corner secs. 19, 30, 24, and 25; T road corners east-west-north	40 44 43.2	90 33 29.2	.....
T. 9 N. R. 2 W., approximately corner secs. 23, 24, 25, and 26, is 50 feet south of road and in line with hedge north	40 44 44.9	90 34 38.7	5,350
T. 9 N., R. 2 W., quarter corner secs. 23 and 26; crossroads	40 44 45.6	90 35 13.3	2,669
T. 9 N., R. 2 W., corner secs. 22, 23, 26, and 27; at north-south hedge row	40 44 46.2	90 35 47.9	2,664
T. 9 N., R. 2 W., corner secs. 21, 22, 27, and 28; T road east	40 44 47.8	90 36 56.4	5,268

Along highways near west border of quadrangle.

T. 6 N., R. 3 W., near middle sec. 4; T road south	40 32 16.7	90 44 34.6	.....
T road corners east-west-north	40 31 22.3	90 44 17.2	5,663
T road corners east-west-south	40 31 23.2	90 44 48.3	2,400
T. 6 N., R. 3 W., approximately quarter corner secs. 9 and 16; T road south	40 30 56.0	90 44 36.6	2,892
T. 6 N., R. 3 W., 30 feet north by 15 feet east of quarter corner between secs. 16 and 21, 35 feet northeast of intersection of cross-roads, inside front yard; iron post stamped "Prim. Trav. Sta. No. 47, 1910, Illinois"	40 30 02.67	90 44 32.21	5,398

Magnetic declination for north border of quadrangle, 5° 33′ E; for south border, 5° 36′ E.; for east border, 5° 34′ E.; for west border, 5° 40′ E.; for center, 5° 44′ E.

LA HARPE QUADRANGLE.

Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 9 N., R. 4 W., quarter corner secs. 26 and 27; crossroads	40 44 29.4	90 49 37.6	.....
T. 9 N., R. 4 W., corner secs. 21, 22, 27, and 28; T road west	40 44 55.8	90 50 46.5	5,946
T. 9 N., R. 4 W., corner secs. 20, 21, 28, and 29; crossroads	40 44 56.9	90 51 55.4	5,300
T. 9 N., R. 4 W., 3,069 feet west of corner secs. 20, 21, 28, and 29, 400 feet east of farmhouse on south side of road, 20 feet north of center of road, close to hedge fence; iron post stamped "Prim. Trav. Sta. No. 5, 1914, Illinois"	40 44 57.0	90 52 35.2	3,069
T. 9 N., R. 4 W., corner secs. 19, 20, 29, and 30; T road south	40 44 56.7	90 53 04.7	2,269
T. 9 N., R. 5 W., east corner secs. 24 and 25, 900 feet from Stronghurst station, 330 feet south of public road crossing Santa Fe Ry.; T road west	40 44 57.4	90 54 13.5	5,292
Crossroads	40 44 57.3	90 54 48.3	2,675
T. 9 N., R. 5 W., near corner secs. 23, 24, 25, and 26; small bridge over stream	40 44 57.3	90 55 21.9	2,590
T. 9 N., R. 5 W., corner secs. 22, 23, 26, and 27; private lane south and T road north	40 44 57.9	90 56 32.0	5,390
T. 9 N., R. 5 W., quarter corner between secs. 22 and 27; T road south	40 44 58.0	90 57 06.1	2,625
T. 9 N., R. 5 W., corner secs. 21, 22, 27, and 28; crossroads	40 44 58.0	90 57 39.9	2,605
T. 9 N., R. 5 W., corner secs. 20, 21, 28, and 29; crossroads	40 44 58.8	90 58 49.2	5,330
T. 9 N., R. 5 W., corner secs. 19, 20, 29, and 30; center of east-west road at hedge fence north-south	40 44 59.2	90 59 57.9	5,285
T. 9 N., R. 5 W., about 0.25 mile east of corner secs. 29, 30, 31, and 32; center of east-west road at T road south	40 44 06.9	90 59 40.4	.....
Tps. 8 and 9 N, at right angle turn in road, west of T road north, near quarter corner on south side sec. 32	40 43 14.4	90 59 24.6	5,448

Along highways near west border of quadrangle.

T. 8 N., R. 5 W., quarter corner between secs. 5 and 8; center of north-south road	40 42 38.1	90 59 25.9	.....
T road forks, north-south-west	40 42 11.2	90 59 26.0	2,720
T. 8 N., R 5 W., apparent quarter corner between secs. 8 and 17; turn in road north and east	40 41 44.8	90 59 26.2	2,677
T. 8 N., R. 5 W., corner secs. 16, 17, 20, and 21; road crossing	40 40 52.7	90 58 51.1	5,919
T. 8 N., R. 5 W., corner secs. 20, 21, 28, and 29; public road crossing at Terre Haute	40 39 58.8	90 58 51.7	5,460

Along highways near east border of quadrangle.

T. 9 N., R. 4 W., quarter corner between secs. 20 and 29, at center of north-south road, lane west, fence east	40 44 53.4	90 45 35.2	.....
T. 9 N., R. 4 W., quarter corner between secs. 29 and 32, at public crossroads	40 44 01.3	90 45 36.2	5,271
T. 8 N., R. 4 W., quarter corner north side sec. 5; T road south (east-west road is on line between Tps. 8 and 9 N.)	40 43 08.8	90 45 33.6	5,308
T. 8 N., R. 4 W., quarter corner between secs. 5 and 8; public crossroads	40 42 26.8	90 45 34.1	4,250
T. 8 N., R. 4 W., quarter corner between secs. 8 and 17; T road north	40 41 34.4	90 45 35.2	5,290
T. 8 N., R. 4 W., corner secs. 16, 17, 20, and 21; T road south	40 40 41.0	90 45 00.3	6,036
T. 8 N., R. 4 W., corner secs. 20, 21, 28, and 29, 50 feet south of T road east; small stone in center of north-south road at T road west	40 39 48.2	90 45 00.7	5,335
T. 8 N., R. 4 W., corner secs. 28, 29, 32, and 33; road crossing	40 38 55.3	90 45 01.5	5,345
T. 7 N., R. 3 W., at north corner secs. 4 and 5, and 50 feet east of corner secs. 32 and 33, at north side of road east and in line with road south; iron post stamped "Prim. Trav. Sta. No. 2, 1914, Ill."	40 38 03.7	90 45 01.8	5,214
T. 7 N., R. 3 W., corner secs. 4, 5, 8, and 9; crossroads	40 37 04.6	90 45 03.3	5,991
T. 7 N., R. 3 W., corner secs. 8, 9, 16, and 17; crossroads	40 36 12.0	90 45 04.6	5,320
T. 7 N., R. 3 W., corner secs. 16, 17, 20, and 21; crossroads	40 35 19.5	90 45 05.5	5,311
T. 7 N., R. 3 W., corner secs. 20, 21, 28, and 29; crossroads	40 34 26.8	90 45 05.7	5,330
T. 7 N., R. 3 W., corner secs. 28, 29, 32, and 33; crossing of Toledo, Peoria & Western Ry. at Scioto	40 33 33.9	90 45 06.1	5,356
T. 7 N., R. 3 W., quarter corner between secs. 32 and 33; crossroads	40 33 07.5	90 45 06.4	2,670
T. 7 N., R. 3 W., south corner secs. 32 and 33; stone in wire-fence line	40 32 41.2	90 45 07.2	2,659

LA HARPE QUADRANGLE—Continued.

Along highways through center of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 7 N., R. 5 W., T road south at north corner secs. 4 and 5, stone on north side east-west road, and 190 feet west of south corner secs. 32 and 33, T. 8 N., R. 5 W.; stone at road north	40 38 11.4	90 58 55.2	
T. 7 N., R. 5 W., north corner secs. 3 and 4; T road south	40 38 14.0	90 57 45.7	5,363
T. 7 N., R. 5 W., north corner secs. 2 and 3, center of east-west road at hedge line south, and 250 feet west of T road north, on south side secs. 34 and 35, T. 8 N., R. 5 W	40 38 15.5	90 56 36.2	5,353
T. 7 N., R. 5 W., north corner secs. 1 and 2; T road south, 130 feet west of T road north, at south corner secs. 35 and 36, T. 8 N., R. 5 W	40 38 15.9	90 55 25.3	5,465
Tps. 7 and 8 N., Rs. 4 and 5 W., corner Henderson, Hancock, and McDonough counties, at T road south	40 38 21.4	90 54 14.8	5,466
Tps. 7 and 8 N., R. 4 W., 25 feet north of T road south, at north corner secs. 5 and 6, 3 feet from hedge fence, 250 feet east of road north; iron post stamped "Prim. Trav. Sta. No. 8, 1914, Illinois"	40 38 19.0	90 53 04.9	5,392
T. 7 N., R. 4 W., T road south at north corner secs. 4 and 5, is 100 feet west of T road north at south corner secs. 32 and 33, T. 8 N., R. 4 W.; stone in center of east-west road	40 38 16.7	90 51 57.2	5,224
T. 8 N., R. 4 W., south corner secs. 33 and 34; T road north (30 feet east of this point is T road south at north corner secs. 3 and 4, T. 7 N., R. 4 W.)	40 38 15.0	90 50 48.8	5,274
Tps. 7 and 8 N., R. 4 W., apparent quarter corner secs. 3 and 34; crossroads	40 38 14.1	90 50 14.2	2,673
Tps. 7 and 8 N., R. 4 W., approximately corner secs. 2, 3, 34, and 35; crossroads	40 38 13.6	90 49 39.0	2,706
Tps. 7 and 8 N., R. 4 W., apparent corner secs. 1, 2, 35, and 36; crossroads	40 38 11.3	90 48 30.6	5,279
Tps. 7 and 8 N., Rs. 3 and 4 W., corner of Henderson, McDonough, and Warren counties	40 38 08.9	90 47 22.4	5,260
T. 8 N., R. 3 W., south corner secs. 31 and 32; T road north (165 feet west of this point is T road south at north corner secs. 5 and 6, T. 7 N., R. 3 W.)	40 38 06.3	90 46 12.0	5,435

Magnetic declination for north border of quadrangle, 4° 49′ E.; for south border, 5° 29′ E.; for east border, 5° 40′ E.; for west border, 5° 40′ E.; for center, 5° 33′ E.

LOMAX QUADRANGLE.

Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 9 N., R. 5 W., quarter corner secs. 19 and 30, at right angle in road	40 44 59.1	91 00 32.2	
T. 9 N., R. 5 W., about 0.5 mile south of quarter corner secs. 19 and 30, 25 feet north of center of east-west road, 95 feet south of small iron bridge; iron post stamped "Prim. Trav. Sta. No. 6, 1914, Illinois"	40 44 33.0	91 00 32.0	2,636
Carman triangulation station, Mississippi River Commission	40 43 31.34	91 01 01.93	

Along highways near east border of quadrangle.

T. 8 N., R. 5 W., near corner secs. 19, 20, 29, 30, center of road west, at north-south hedge on section line; road east is about 50 feet north of above	40 39 57.2	91 00 02.6	
T. 8 N., R. 5 W., quarter corner between secs. 19 and 30; T road south	40 39 57.4	91 00 37.6	2,698
Dugout Creek; center of iron truss bridge over	40 39 13.8	91 00 37.7	4,410
T. 8 N., R. 5 W., near quarter corner secs. 30 and 31, at top of hill; T road forks	40 38 59.4	91 00 37.9	1,450
T. 8 N., Rs. 5 and 6 W., on line between secs. 31 and 36; T road south	40 38 58.7	91 01 19.8	3,234
Tps. 7 and 8 N., Rs. 5 and 6 W., 20 feet south and 25 feet east of crossroads, near corner fence post; iron post stamped "Prim. Trav. Sta. No. 7, 1914, Illinois"	40 38 05.8	91 01 19.4	5,355
T. 7 N., R. 5 W., north corner secs. 5 and 6; stone in east-west road at hedge south (75 feet east is fence line north)	40 38 09.2	91 00 04.4	5,791
Disco, north side of; railroad crossing	40 37 18.4	91 01 19.4	
Disco, at intersection of main public crossroads, corner secs. 1, 6, 7, and 12, T. 7 N., Rs. 5 and 6 W	40 37 13.1	91 01 19.2	535

LOMAX QUADRANGLE—Continued.

Along highways near east border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 7 N., R. 6 W., east corner secs. 12 and 13; T road west (60 feet south of this point is west corner secs. 7 and 18, at road east)	40 36 20.1	91 01 19.3	5,360
T. 7 N., R. 6 W., east corner secs. 13 and 24; fence line west (70 feet south of this point is west corner secs. 18 and 19, T. 7 N., R. 5 W., fence line east)	50 35 27.2	91 01 19.9	5,350
Center of east-west road, at T road north	40 34 49.4	91 01 20.1	3,830
T road forks east-west-north, center of	40 34 08.1	91 01 01.0	4,425
T. 7 N., R. 5 and 6 W., quarter corner secs. 25 and 30; T road east (road north only goes about 300 feet to house)	40 34 07.6	91 01 20.1	1,480
T. 7 N., Rs. 5 and 6 W., corner secs. 25, 30, 31, and 36; T road west	40 33 40.9	91 01 20.3	2,710
Tps. 6 and 7 N., Rs. 5 and 6 W.; T road forks east-west-north	40 32 47.4	91 01 20.6	5,411
T road forks east-west-south	40 32 48.2	91 01 01.0	1,510
La Crosse station, at center of Toledo, Peoria & Western R. R. tracks	40 31 41.6	91 01 22.5	6,937
T. 6 N., Rs. 5 and 6 W., corner secs. 7, 12, 13, and 18; T road west	40 31 01.5	91 01 23.3	4,060
T. 6 N., Rs. 5 and 6 W., 30 feet northwest of quarter corner between secs. 13 and 18, northwest corner of crossroads, at corner of front yard; iron post stamped "Prim. Trav. Sta. No. 49, 1910, Illinois"	40 30 35.70	91 01 23.90	2,613

Magnetic declination for north border of quadrangle, 4° 35′ E.; for east border, 5° 40′ E.

MONMOUTH QUADRANGLE.

Along highways near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 9 N., R. 1 W., corner secs. 16, 17, 20, and 21, at right angle in road	40 45 36.4	90 31 13.3	.....
Iron bridge over creek, center of	40 45 28.5	90 31 40.5	2,243
T road corners, roads north-south-east	40 45 22.8	90 33 28.4	8,322
T. 9 N., R. 2 W., 30 feet north and 25 feet east of crossroads at corner secs. 15, 16, 21, and 22, near schoolhouse; iron post stamped "Prim. Trav. Sta. No. 3, 1914, Illinois"	40 45 40.5	90 36 55.0	.....
T. 9 N., R. 2 W., corner secs. 16, 17, 20, and 21; crossroads	40 45 41.0	90 38 04.1	5,320
T. 9 N., R. 2 W., corner secs. 17, 18, 19, and 20, hedge row north-south, lane southwest to house	40 45 41.0	90 39 13.8	5,360
T. 9 N., R. 2 W., quarter corner secs. 18 and 19; crossroads	40 45 41.6	90 39 47.8	2,620
T. 9 N., Rs. 2 and 3 W., corner secs. 18, 19, 13, and 24, hedge row north-south, center of east-west road	40 45 42.3	90 40 24.4	2,819
T. 9 N., R. 3 W., corner secs. 13, 14, 23, and 24; road crossing	40 45 43.3	90 41 33.2	5,291
T. 9 N., R. 3 W., corner secs. 14, 15, 22, and 23; road crossing	40 45 44.9	90 42 42.1	5,310
T. 9 N., R. 3 W., quarter corner secs. 15 and 22; road crossing	40 45 45.1	90 43 16.6	2,650
T. 9 N., R. 3 W., corner secs. 15, 16, 21, and 22, road crossing	40 45 45.2	90 43 51.2	2,660

Magnetic declination for south border of quadrangle, 5° 33′ E

OQUAWKA QUADRANGLE.

Along highways near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 9 N., R. 3 W., corner secs. 16, 17, 20, and 21; T road south	40 45 45.6	90 45 00.0	.....
T. 9 N., R. 3 W., quarter corner secs. 17 and 20, 40 feet east and 30 feet south of crossroads; iron post stamped "Prim. Trav. Sta. No. 4, 1914, Illinois"	40 45 45.9	90 45 34.2	2,627
T. 9 N., R. 3 W., corner secs. 17, 18, 19, and 20; road crossing	40 45 46.4	90 46 09.1	2,690
T. 9 N., R. 3 W., quarter corner secs. 18 and 19; center road crossing	40 45 46.8	90 46 44.1	2,690
T. 9 N., R. 3 W., west corner secs. 18 and 19, right angle turn in road, on line between Henderson and Warren counties	40 45 46.9	90 47 18.5	2,650
T. 9 N., R. 4 W., quarter corner secs. 23 and 24; T road south	40 45 21.8	90 48 28.0	5,917
T. 9 N., R. 4 W., quarter corner secs. 22 and 23; T road south	40 45 21.8	90 49 37.3	5,330

Magnetic declination for south border of quadrangle, 4° 49′ E.

Birds, Merom, and Vincennes quadrangles.

CRAWFORD AND LAWRENCE COUNTIES.

The following geographic positions on North American datum were determined by primary traverse by C. B. Kendall, in 1913. Beginning with adjusted position at Robinson the line follows public roads via Palestine to Riverton, Ind., and is tied to the United States Coast and Geodetic Survey triangulation station Merom and also to the United States Corps of Engineers bench mark No. 32 at Riverton.

A line was also run which begins at United States Coast and Geodetic Survey astronomic station at Vincennes, follows public roads north to center of Birds quadrangle at Canaan Church, thence west, and is tied to the United States Coast and Geodetic Survey station Honey Creek.

BIRDS QUADRANGLE.

Along public roads.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 4 N., R. 10 W., corner secs. 19, 20, 29, 30, public T road east at, 5 feet west to corner fence, 40 feet northeast to southwest corner of house	38 45 44.1	87 33 25.1	
T. 4 N., R. 10 W., quarter corner between secs. 19 and 20, public T road north, 15 feet north to center of triangle	38 46 11.0	87 33 27.0	2,726
T. 4 N., R. 10 W., corner secs. 17, 18, 19, and 20, public T road west	38 46 37.6	87 33 26.3	2,693
T. 4 N., R. 10 W., quarter corner between secs. 17 and 18, second-class T road east, 5 feet east to center of triangle	38 47 04.1	87 33 26.0	2,679
T. 4 N., R. 10 W., corner secs. 7, 8, 17, and 18, center of north-south road at east and west fences	38 47 30.8	87 33 26.7	2,800
T. 4 N., R. 10 W., quarter corner between secs. 7 and 8, at T road east	38 47 57.7	87 33 27.1	2,720
T. 4 N., R. 10 W., corner secs. 5, 6, 7, and 8, at 90° bend in road to west, 890 feet north of public T road east	38 48 25.0	87 33 27.6	2,761
T. 4 N., R. 10 W., corner secs. 5, 6, 7, and 8, 3,920 feet west of; public T road north	38 48 25.1	87 34 17.2	3,920
T. 4 N., Rs. 10–11 W., stone at west corner secs. 6 and 7; stone is in east-west road 20 feet west of public T road south	38 48 25.0	87 34 32.8	1,240
T. 4 N., Rs. 10–11 W., stone at west corner secs. 6 and 7, 4,030 feet north of; Union Schoolhouse, 1.3 miles south of; 3-cornered public T road west, 10 feet west to center of triangle	38 49 04.9	87 34 32.8	4,034
Union schoolhouse, 1 mile south of: three-corners public T road east	38 49 22.7	87 34 32.8	1,800
Union schoolhouse, 0.5 mile south of; three-corners public T road east, 20 feet to culvert	38 49 49.7	87 34 32.5	2,730
Union schoolhouse, public T road west at	38 50 12.3	87 34 32.9	2,290
Union schoolhouse, 1 mile north of, T. 5 N., Rs. 10 and 11 W., east corner secs. 24 and 25, on line between Crawford and Lawrence counties, at picket fence west of southeast corner of an oak grove and 1,370 feet north of a public T road west	38 51 06.3	87 34 32.4	5,461
NOTE.—260 feet north of the above is T. 5 N., Rs. 10 and 11 W., west corner secs. 19 and 30, and is also line between Crawford and Lawrence counties at wire fence nearly opposite the northeast corner of oak grove.			
Canaan Church, public crossroads, 15 feet southwest to two mail boxes, 15 feet north to box drain	38 51 46.7	87 34 32.0	4,090
NOTE.—1,280 feet north of the above is T. 5 N., Rs. 10 and 11 W., east corner secs. 13 and 24, at wire fence west, 200 feet north of this corner is the west corner secs. 18 and 19, at wire fence east.			
Canaan Church, 1 mile west of, public T road north on line between secs. 13 and 14, T. 5 N., R. 11 W	38 51 46.6	87 35 39.9	5,370
T. 5 N., R. 11 W., corner secs. 14, 15, 22, and 23, 35 feet north of; in the northwest corner of the Higgins schoolhouse yard, 35 feet east of center of north-south road opposite and in line with center of public T road west; iron post stamped "Prim. Trav. Sta. No. 12, 1913, Illinois"	38 52 00.0	87 36 48.1	5,560
T. 5 N., R. 11 W., stone corner secs. 15, 16, 21, and 22, public T road south	38 52 00.2	87 37 56.1	5,380
T. 5 N., R. 11 W., quarter corner between secs. 16 and 21, 560 feet south of; public T road west	38 51 55.0	87 38 30.2	2,750
T. 5 N., R. 11 W., corner secs. 16, 17, 20, and 21, at corner of wire fence, 50 feet northwest of the northwest corner of schoolhouse	38 52 00.7	87 39 04.1	2,738

BIRDS QUADRANGLE—Continued.

Along public roads—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 5 N., R. 11 W., quarter corner between secs. 17 and 20, at public crossroads	38 52 00.6	87 39 38.4	2,717
Flat Rock, 2.25 miles south of; east-west public road crossing Big Four R. R., center of track at	38 52 00.8	87 40 10.9	2,570
T. 5 N., R. 11 W., west corner secs. 18 and 19, at public T road east, 240 feet north of bridge over Sugar Creek	38 52 01.4	87 41 03.9	4,192
NOTE.—270 feet south of the above is T. 5 N., R. 12 W., east corner secs. 13 and 24, corner is in creek about 50 feet east of center of north-south road at T road west, 40 feet south of center of iron bridge over Sugar Creek.			
T. 5 N., R. 12 W., stone corner secs. 13, 14, 23, and 24, at public crossroads	38 51 56.9	87 42 11.9	5,405
T. 5 N., R. 12 W., corner secs. 22, 23, 26, and 27; corner is about 10 feet west of oak tree, 15 feet north of a gate and 100 feet west of a 90° bend of road to north	38 51 55.3	87 43 18.4	5,263
T. 5 N., R. 12 W., center sec. 15 at public T road west	38 52 20.4	87 43 52.9	3,721
T. 5 N., R. 12 W., corner secs. 2, 3, 10, and 11, at fences north and south	38 53 41.0	87 43 19.4	8,581
Union Church, 1.2 miles south of, public T road west at tool house	38 53 42.0	87 42 46.3	2,620
Union Church and schoolhouse, Tps. 5 and 6 N., R. 12 W., quarter corner between secs. 2 and 35, at public T road west	38 54 41.4	87 42 46.0	6,013
Honey Creek triangulation station, U. S. Coast and Geodetic Survey	38 55 28.78	87 42 36.78	4,849

Magnetic declination for east border of quadrangle, 3° 03′ E.; for center, 3° 14′ E.; for north border, 3° 07′ E.

MEROM QUADRANGLE.

Along public roads on south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Robinson, primary traverse station No. 13, 1907 (Bull. 440)	39 00 18.2	87 44 21.6	.....
Robinson, Main Street crossing Big Four R. R.; center of main track	39 00 21.3	87 43 51.6	2,393
Robinson, 1.2 miles east of, second-class road northeast (may be old Indian grant line); center of main road	39 00 21.9	87 43 01.0	3,990
T. 7 N., R. 12 W., quarter corner between secs. 35 and 36; public T road south	39 00 28.5	87 42 13.1	3,837
T. 7 N., Rs. 11 and 12 W., quarter corner between secs. 31 and 36; public crossroads	39 00 20.2	87 41 05.0	5,379
T. 7 N., R. 11 W., quarter corner between secs. 31 and 32; public T road north, 15 feet north to center of triangle	39 00 28.8	87 40 04.3	4,790
T. 7 N., R. 11 W., quarter corner between secs. 32 and 33; center of east-west road at wire fence north at white house	39 00 27.7	87 38 57.3	5,290
T. 7 N., R. 11 W., center of sec. 33; public crossroads	39 00 27.0	87 38 23.4	2,680
T. 7 N., R. 11 W., quarter corner between secs. 33 and 34; center of east-west road opposite T fence south	39 00 26.5	87 37 49.6	2,670
Palestine, 800 feet northwest of pumping station; public T road north, center of east-west road at	39 00 26.2	87 37 33.0	1,310
Palestine, at northwest corner of, 600 feet east of pumping station, Illinois Central R. R. crossing north-south public road, south rail at (270 feet north and 30 feet east of the above is T. 7 N., R. 11 W., center of sec. 34)	39 00 23.2	87 37 16.6	1,326
Palestine, in the northwest corner of public-school grounds, 130 feet northwest of the northwest corner of school building, 40 feet south and 70 feet east of the intersection of Franklin and West Main streets; iron post stamped "Prim. Trav. Sta. No. 11, 1913, Illinois"	39 00 13.3	87 36 44.9	2,695
T. 7 N., R. 11 W., quarter corner between secs. 35 and 36, at public T road north, 300 feet south of bridge over Super Creek	39 00 24.6	87 36 42.8	1,142
Palestine, 1 mile east of, west rail of Illinois Central R. R. at public east-west road crossing (530 feet east of the above is T. 7 N., R. 11 W., quarter corner between secs. 35 and 36)	39 00 24.3	87 35 43.0	4,716
Riverton, 1 mile southwest of; center of Illinois Central R. R. over drainage ditch	39 00 54.3	87 34 58.3	4,654
Riverton, Illinois Central R. R. bridge over Wabash River; center of draw span	39 01 13.7	87 34 07.8	4,444
Riverton, U. S. Engineers iron bench mark No. 32	39 01 07.99	87 34 04.55	621

Magnetic declination for south border of quadrangle, 3° 07′ E.

VINCENNES QUADRANGLE.

Along public roads.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Vincennes, Baltimore & Ohio R. R. crossing; First Street, center of main track at (Dup.)	38 41 04.2	87 31 32.3	
Vincennes, Wabash River bridge, 0.8 mile northwest of; three-corners public T road south	38 41 24.5	87 32 44.0	6,047
T. 3 N., R. 10 W., corner secs. 7, 8, 17, and 18, 1,620 feet south of; public T road north	38 41 54.3	87 33 20.5	4,181
T. 3 N., R. 10 W., corner secs. 7, 8, 17 and 18; T road west at, 460 feet south of railroad crossing	38 42 10.3	87 33 20.7	1,625
T. 3 N., R. 10 W., corner secs. 7, 8, 17, and 18, 480 feet north of; north and south road crossing Baltimore & Ohio Southwestern R. R.; center of track at	38 42 15.0	87 33 21.0	479
T. 3 N., R. 10 W., corner secs. 5, 6, 7, and 8; center of north-south road at small bridge and hedge east	38 43 03.9	87 33 21.2	4,942
T. 3 N., R. 10 W., north corner secs. 5 and 6, at 90° bend in road to west	38 43 58.6	87 33 21.6	5,540
NOTE.—300 feet west of the above is T. 4 N., R. 10 W., south corner secs. 31 and 32, at 90° bend of road to north.			
T. 4 N., R. 10 W., corner secs. 29, 30, 31, and 32; crossroads at	38 44 51.8	87 33 25.2	5,384
T. 4 N., R. 10 W., corner secs. 19, 20, 29, 30; public T road east (Dup.)	38 45 44.1	87 33 25.1	5,296

Magnetic declination for northeast border of quadrangle, 3° 14′ E.

Earlville, Genoa, Kirkland, Plano, Rochelle, Shabbona, and Sycamore quadrangles.

DEKALB, LEE, AND OGLE COUNTIES.

The following geographic positions upon North American datum were determined by E. L. McNair in 1914. They are based on positions in this locality given in Bulletin 551.

EARLVILLE QUADRANGLE.

Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 38 N., R. 2 E., about 0.25 mile south of corner secs. 21, 22, 27, and 28, 35 feet south and 25 feet east of center of road crossing, 8 feet west of corner hedges; iron post stamped "Prim. Trav. Sta. No. 4, 1912, Illinois" (new position)	41 44 32.9	88 59 58.4	
T. 38 N., R. 2 E., corner secs. 21, 22, 27, and 28; center of north-south road at fence east	41 44 46.5	88 59 59.2	1,377
T. 38 N., R. 2 E., corner secs. 23, 24, 25, and 26; T road east	41 44 47.5	88 57 38.8	
T. 38 N., R. 2 E., at east corner secs. 24 and 25; north-south road at road west of Dekalb-Lee county line (25 feet south of above is west corner secs. 19 and 30, T. 38 N., R. 3 E., center of north-south road, in line with road east and fence line west)	41 44 47.1	88 56 28.3	5,350
T. 38 N., R. 3 E., corner secs. 19, 20, 29, and 30; T road north	41 44 47.1	88 55 30.5	4,380
Chicago, Burlington & Quincy R. R. crossing at east rail	41 44 47.1	88 55 17.7	970
T. 38 N., R. 3 E., corner secs. 20, 21, 28, and 29; center of east-west road at fences north-south	41 44 47.3	88 54 20.8	4,320
Big Indian Creek; center of iron truss bridge	41 44 48.0	88 53 16.4	4,885
T. 38 N., R. 3 E., corner secs. 21, 22, 27, and 28; center of east-west road at private lane south; fence north	41 44 48.0	88 53 10.8	426
T. 38 N., R. 3 E., quarter corner between secs. 22 and 27; T road west at fence east	41 44 48.4	88 52 34.4	2,608
T. 38 N., R. 3 E., about 0.25 mile west of corner secs. 26, 27, 34, and 35, 30 feet south and 35 feet west of center of crossroads; 2 feet east of corner fence post; iron post stamped "Prim. Trav. Sta. No. 26, 1914, Illinois"	41 43 56.0	88 52 19.1	5,462
T. 38 N., R. 3 E., corner secs. 26, 27, 34, and 35; center of east-west road at fence lines north-south	41 43 56.4	88 52 01.5	1,339
Shabbona Grove, center of east-west road at T road south; under Chicago & North Western R. R. bridge	41 43 56.4	88 51 08.5	4,020
T. 38 N., Rs. 3 and 4 E., corner secs. 25, 36, 30, and 31; center of east-west road at north-south fences	41 43 56.5	88 49 41.3	6,610
T. 38 N., R. 4 E., quarter corner between secs. 30 and 31; T road north	41 43 56.6	88 49 17.7	1,795

EARLVILLE QUADRANGLE—Continued.

Along highways near north border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 38 N., R. 4 E., corner secs. 29, 30, 31, and 32; center of east-west road at north-south fences	41 43 56.5	88 48 42.7	2,655
Clinton schoolhouse, center of public crossroads at	41 43 56.6	88 48 25.6	1,300
T. 38 N., R. 4 E., corner secs. 28, 29, 32, and 33; center of east-west road at north-south fence lines	41 43 56.8	88 47 33.1	3,980
T. 38 N., R. 4 E., corner secs. 27, 28, 33, and 34; crossroads	41 43 57.2	88 46 23.6	5,270
T. 38 N., R. 4 E., corner secs. 26, 27, 34, and 35; center of east-west road at north-south fence	41 43 57.6	88 45 13.7	5,305

Magnetic declination near north border of quadrangle, 3° 35′ E.

GENOA QUADRANGLE.

On highway near southwest corner of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 41 N., R. 4 E., near center of sec. 26; 30 feet south and 40 feet east of crossroads, 750 feet north of Chicago & Great Western R. R. tracks; iron post stamped "Prim. Trav. Sta. No. 29, 1914, Illinois"	42 00 06.7	88 44 23.6	

Magnetic declination near southwest corner of quadrangle, 3° 17′ E.

KIRKLAND QUADRANGLE.

Along highways near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 41 N., R. 4 E., Chicago & Great Western R. R. crossing	42 00 06.7	88 45 14.4	
T. 41 N., R. 4 E., quarter corner between secs. 27 and 28; center of east-west road at north-south fences	42 00 06.4	88 46 22.7	5,155
T. 41 N., R. 4 E., quarter corner between secs. 27 and 28, about 0.25 mile west of; T road south	42 00 06.3	88 46 40.4	1,335
T. 41 N., R. 4 E., near center of sec. 28, 110 feet west of T road north; Illinois, Iowa & Minnesota R. R. crossing	42 00 06.2	88 46 55.5	1,140
T. 41 N., R. 4 E., quarter corner between secs. 28 and 29; center of east-west road at north-south fence line	42 00 06.1	88 47 32.9	2,825
T. 41 N., R. 4 E., quarter corner between secs. 29 and 30; center of east-west road at north-south fence lines	42 00 05.8	88 48 43.2	5,305
T. 41 N., Rs. 3 and 4 E., quarter corner between secs. 25 and 30; center of public road crossing	42 00 05.6	88 49 44.8	4,650
T. 41 N., R. 3 E., quarter corner between secs. 25 and 26, at fence south and T road north	42 00 04.7	88 50 55.0	5,301
T. 41 N., R. 3 E.; crossroads at center of sec. 26	42 00 04.4	88 51 29.9	2,630
T. 41 N., R. 3 E., 25 feet north and 47 feet west of crossroads, in center of sec. 27, 17 feet west of corner fence post and 2 feet south of fence line; iron post stamped "Prim. Trav. Sta. No. 30, 1914, Illinois	42 00 04.4	88 52 41.2	5,382
T. 41 N., R. 3 E., center of road crossing at center of sec. 28	42 00 04.0	88 53 50.7	5,250
T. 41 N., R. 3 E., quarter corner between secs. 28 and 29; east-west road at north-south fence line	42 00 03.7	88 54 25.8	2,650
T. 41 N., R. 3 W., center of sec. 29; road crossing	42 00 03.6	88 55 01.1	2,660
T. 41 N., R. 3 E., center of sec. 30; T road east	42 00 03.4	88 56 11.6	5,320
T. 41 N., R. 3 E., quarter corner between secs. 19 and 30; T road west at fence east	42 00 29.4	88 56 11.7	2,635
T. 41 N., Rs. 2 and 3 E., corner secs. 24, 25, 19, and 30, on Dekalb-Ogle county line; center of east-west road at north-south fence line	42 00 29.3	88 56 30.0	1,380
T. 41 N., R. 2 E., corner secs. 23, 24, 25, and 26; center of cross-roads	42 00 28.4	88 57 40.5	5,325
T. 41 N., R. 2 E., corner secs. 22, 23, 26, and 27; stone at cross-roads	42 00 27.5	88 58 50.6	5,290

Magnetic declination near south border of quadrangle, 3° 27′ E.

PLANO QUADRANGLE.

Along highways near northwest corner of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 38 N., R. 4 E., about 0.25 mile east of corner secs. 26, 27, 34, and 35, 25 feet south of center of east-west road, in line with road north, 30 feet west of center of road south, 3 feet north of fence corner; iron post stamped "Prim. Trav. Sta. No. 27, 1914, Illinois"	41 43 57.5	88 44 56.7	.....
T. 38 N., R. 4 E., 0.25 mile east of corner secs. 22, 23, 26, and 27; public road crossing	41 44 49.9	88 44 56.9	5,300

Magnetic declination near northwest corner of quadrangle, 3° 21′ E.

ROCHELLE QUADRANGLE.

On highway near southeast corner of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 38 N., R. 2 E., corner secs. 15, 16, 21, and 22; center of crossroads at school and church buildings	41 45 39.4	89 00 00.4	.....

SHABBONA QUADRANGLE.

Along highways near southwest corner of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 38 N., R. 2 E., quarter corner between secs. 21 and 22; T road east	41 45 12.9	88 59 59.8	.....
T. 38 N., R. 2 E., corner secs. 14, 15, 22, and 23; T road north at fence line south	41 45 39.4	88 58 49.8	.....
T. 38 N., R. 2 E., corner secs. 13, 14, 23, and 24; center of crossroads.	41 45 39.9	88 57 38.7	5,389

Along highways near east border of quadrangle.

T. 38 N., R. 4 E., corner secs. 14, 15, 22, and 23; T road north	41 45 42.0	88 45 14.4	.....
T. 38 N., R. 4 E., quarter corner between secs. 14 and 15; center of Chicago, Burlington & Quincy R. R. crossing (azimuth of railroad at above point is 269° 21′ 11″)	41 46 08.6	88 45 14.5	2,690
T. 38 N., R. 4 E., corner secs. 10, 11, 14, and 15; 1 mile east of Waterman; center of public crossroads	41 46 34.2	88 45 14.6	2,585
T. 38 N., R. 4 E., corner secs. 2, 3, 10, and 11; public crossroads	41 47 26.9	88 45 14.0	5,335
Tps. 38 and 39 N., R. 4 E., corner secs. 2, 3, 34, and 35; center of road crossing (10-foot jog in north-south fence line on each side of road)	41 48 20.6	88 45 13.4	5,440
T. 39 N., R. 4 E., corner secs. 26, 27, 34, and 35; road crossing	41 49 13.0	88 45 13.2	5,300
T. 39 N., R. 4 E., corner secs. 22, 23, 26, and 27; T road west	41 50 05.2	88 45 13.5	5,290
T. 39 N., R. 4 E., corner secs. 14, 15, 22, and 23; crossroads	41 50 57.5	88 45 13.2	5,290
T. 39 N., R 4 E., corner secs. 10, 11, 14, and 15, 25 feet east of center of north-south road at T road west; iron post stamped "Prim. Trav. Sta. No. 28, 1914, Illinois"	41 51 49.8	88 45 12.5	5,296
T. 39 N., R. 4 E., corner secs. 2, 3, 10, and 11; center of crossroads	41 52 42.2	88 45 12.6	5,302
T. 40 N., R. 4 E., south corner secs. 34 and 35; center of east-west road in line with T road north (40 feet west of above is north corner secs. 2 and 3, T. 39 N., R. 4 E., at center of east-west road at T road south)	41 53 34.6	88 45 11.8	5,305
Chicago & North Western R. R. crossing (azimuth of railroad at this point is 204° 12′ 46″)	41 53 59.2	88 45 11.5	2,480
T. 40 N., R. 4 E., corner secs. 26, 27, 34, and 35; center of crossroads.	41 54 26.8	88 45 11.6	2,800

SHABBONA QUADRANGLE—Continued.

Along highways through center of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 39 N., R. 2 E., corner secs. 10, 11, 14, and 15; center of crossroads.	41 51 45.0	88 58 50.9	.....
T. 39 N., R. 2 E., corner secs. 11, 12, 13, and 14; center of crossroads.	41 51 45.3	88 57 39.7	5,390
T. 39 N., R. 2 E., east corner secs. 12 and 13; T road west on Lee-Dekalb county line (110 feet north of this point is west corner secs. 7 and 18, T. 39 N., R. 3 E., at T road east)	41 51 46.2	88 56 27.5	5,470
T. 39 N., R. 3 E., corner secs. 7, 8, 17, and 18; road crossing	41 51 47.3	88 55 29.2	4,409
T. 39 N., R. 3 E., corner secs. 8, 9, 16, and 17; crossroads	41 51 48.3	88 54 18.5	5,351
T. 39 N., R. 3 E., corner secs. 9, 10, 15, and 16; crossroads	41 51 48.7	88 53 09.9	5,195
T. 39 N., R. 3 E., 355 feet west and 23 feet north of center of crossroads at corner secs. 10, 11, 14, and 15, opposite house of Thomas Maley; iron post stamped "Prim. Trav. Sta. No. 31, 1914, Illinois"	41 51 48.1	88 52 05.0	4,915
T. 39 N., R. 3 E., corner secs. 11, 12, 13, and 14; road crossing	41 51 48.2	88 50 51.2	5,585
T. 39 N., R. 3 E., east corner secs. 12 and 13, at T road west (60 feet north of above corner is west corner secs. 7 and 18, T. 39 N., R. 4 E., T road east)	41 51 48.3	88 49 39.6	5,418
T. 39 N., R. 4 E., corner secs. 7, 8, 17, and 18; T road south	41 51 49.0	88 48 42.6	4,312
T. 39 N., R. 4 E., corner secs. 8, 9, 16, and 17; center of crossroads.	41 51 49.6	88 47 32.9	5,280
Eloa, center of Chicago & North Western R. R. tracks at	41 51 49.6	88 46 29.4	4,800
T. 39 N., R. 4 E., corner secs. 9, 10, 15, and 16; center of crossroads.	41 51 49.6	88 46 23.0	486

Magnetic declination near north border of quadrangle, 3° 27′ E.; near south border, 3° 35′ E.; near east border, 3° 09′ E.; near west border, 1° 57′ E.–3° 56′ E. (from Bulletin 551); near center, 3° 28′ E.

SYCAMORE QUADRANGLE.

Along highways near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 38 N., R. 4 E., 0.25 mile east of corner secs. 14, 15, 22, and 23; T road south	41 45 42.2	88 44 57.2	.....
Dekalb, center of crossing of Chicago & North Western R. R. and Fourth Street	41 55 46.5	88 44 59.1	.....
Dekalb, just north of; center of iron truss bridge over the Kishwaukee River	41 56 22.2	88 44 58.7	3,608
T. 40 N., R. 4 E., near quarter corner between secs. 2 and 11; crossing of Chicago, Milwaukee & Gary R. R.	41 57 48.1	88 44 35.0	8,875
T. 40 N., R. 4 E., forks at schoolhouse; roads northeast, northwest, and southwest	41 58 18.0	88 44 04.8	3,793
T. 41 N., R. 4 E., at east side of sec. 35; roads north-south-west	41 59 20.4	88 44 16.5	6,368

Magnetic declination near north border of quadrangle, 3° 09′ E.

Dwight, Essex, Joliet, Kankakee, Morris, Peotone, Wilmington, and Yorkville quadrangles.

GRUNDY, KANKAKEE, KENDALL, AND WILL COUNTIES.

The following geographic positions were determined by primary traverse and are based on North American datum positions of United States Corps of Engineers triangulation stations, Dresden Heights, Devine, and Rock Run, and on United States Geological Survey primary traverse stations published in Bulletin 551.

The work in Dwight, Morris, and Yorkville quadrangles was done by E. L. McNair in 1914; that in Essex, Joliet, Kankakee, and Peotone quadrangles by J. H. Wilson in 1915; and that in Wilmington quadrangle by McNair in 1914 and by Wilson in 1915.

DWIGHT QUADRANGLE.

Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Primary traverse station No. 9 (published in Bull. 551, p. 163)	41 14 31.5	88 29 35.9	
T. 32 N., Rs. 6 and 7 W., corner secs. 13, 24, 18 and 19; T road south	41 14 24.2	88 28 26.5	5,351
T. 32 N., R. 7 E., corner secs. 17, 18, 19, and 20; crossroads	41 14 25.7	88 27 27.0	4,551
T. 32 N., R. 7 E., corner secs. 16, 17, 20, and 21; crossroads	41 14 27.4	88 26 17.5	5,309
T. 32 N., R. 7 E., corner secs. 15, 16, 21, and 22; crossroads	41 14 29.2	88 25 08.0	5,310
T. 32 N., R. 7 E., corner secs. 14, 15, 22, and 23; crossroads	41 14 30.8	88 23 58.7	5,299
T. 32 N., R. 7 E.; corner secs. 13, 14, 23, and 24; center east and west roads	41 14 32.4	88 22 49.6	5,279
T. 32 N., R. 7 E., quarter corner between secs. 13 and 24; crossroads	41 14 33.2	88 22 14.6	2,669
T. 32 N. (approximate) on line between Rs. 7 and 8, center of iron truss bridge	41 14 34.0	88 21 40.6	2,600
T. 32 N., R. 8 E., about 0.20 mile east of west corner of secs. 18 and 19, 25 feet south of center of road, 2 feet from corner post at northwest corner of fence, in yard of M. Z. Bullon; iron bench-mark post stamped "Prim. Trav. Sta. No. 21, 1914, Illinois"	41 14 34.2	88 21 27.7	987
T. 32 N., R 8 E., 45 feet north of south end of (iron) truss bridge in line with road west on section line, apparent corner secs. 17, 18, 19, and 20	41 14 35.5	88 20 30.8	4,345
T. 32 N., R. 8 E., corner secs. 16, 17, 20, and 21; crossroads	41 14 37.4	88 19 21.1	5,327
T. 32 N., R. 8 E., approximate corner secs. 15, 16, 21, and 22; T road W	41 14 38.7	88 18 11.9	5,286

Magnetic declination for north border of quadrangle, 2° 45′ E.

ESSEX QUADRANGLE.

Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Custer Park, on north side of road opposite store of F. A. Buza; iron post stamped "Prim. Trav. Sta. No. 17, 1915, Ill.;" elevation, 563 feet	41 14 43.6	88 07 48.4	
Custer Park, Wabash R. R. bridge over Kankakee River, west end of	41 14 42.6	88 07 41.7	521
Railroad crossing, north and south section line	41 14 54.9	88 07 29.2	1,570
T. 32 N., R. 10 E., road east on line between secs. 17 and 20	41 14 53.9	88 05 43.2	
T. 32 N., R. 10 E., corner of secs. 16, 17, 20, and 21, north and south fence line	41 14 54.2	88 05 24.3	1,440
T. 32 N., R. 10 E., corner of secs. 15, 16, 21, and 22, north and south fence line at schoolhouse	41 14 54.9	88 04 15.1	5,290
T. 32 N., R. 10 E., corner of secs. 14, 15, 22, and 23, north and south fence just west of mail box 59	41 14 56.1	88 03 05.0	5,350
T. 32 N., R. 10 E., corner of secs. 13, 14, 23, and 24; T road south	41 14 56.6	88 01 54.7	5,370
T. 32 N., Rs. 10 and 11 E., corner of secs. 13, 24, 18, and 19; crossroads at schoolhouse, Will-Kankakee county line	41 14 56.9	88 00 46.2	5,230

Magnetic declination for north border of quadrangle, 3° E.

JOLIET QUADRANGLE.

Along highways near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 35 N., R. 11 E., corner of secs. 17, 18, 19, 20, and 30 feet east and 25 feet north of, at northeast corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 21, 1915, Ill."	41 30 41.8	88 00 15.3	
T. 35 N., R. 11 E., west corner of secs. 18 and 19, in line with road east (45 feet south of above corner is T. 35 N., R. 10 E., east corner of secs. 13 and 24, in line with road west)	41 30 40.2	88 01 24.4	5,264
T. 35 N., R. 10 E., corner of secs. 13, 14, 23, and 24; crossroads	41 30 38.1	88 02 33.4	5,255
T. 35 N., R. 10 E., quarter corner between secs. 23 and 24; T road north	41 30 12.1	88 02 32.6	2,635
T. 35 N., R. 10 E., quarter corner between secs. 22 and 23, crossroads at Baldoregganis's grocery store	41 30 10.6	88 03 41.6	5,250
Joliet, center of street-car track at intersection of Richards Street and Mills Road, quarter corner in center of sec. 22	41 30 09.8	88 04 16.2	2,640
Joliet, intersection of Chicago Street and Mills Road, quarter corner between secs. 21 and 22, T. 35 N., R. 10 E	41 30 09.0	88 04 50.9	2,640

Magnetic declination for south border of quadrangle, 2¾° E.

KANKAKEE QUADRANGLE.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 32 N., R. 11 E., corner of secs. 17, 18, 19, and 20, 30 feet north and 20 feet east of, at northeast corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 18, 1915, Ill."	41 14 57.4	87 59 35.3	.....

MORRIS QUADRANGLE.

Along highways near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 32 N., R. 8 E., corner secs. 9, 10, 15, and 16; road crossing	41 15 31.1	88 18 13.5	.....
T. 32 N., R. 8 E., near quarter-section line between secs. 10 and 11; railroad crossing, center of	41 15 31.8	88 17 37.8	2,725
T. 32 N., R. 8 E., corner secs. 10, 11, 14, and 15; crossroads	41 15 32.3	88 17 04.2	2,570
T. 32 N., R. 8 E., corner secs. 11, 12, 13, and 14; crossroads	41 15 33.8	88 15 55.0	5,280
T. 34 N., Rs. 8 and 9 E., corner secs. 18, 19, 13, and 24; T road north on Grundy-Will county line	41 25 09.0	88 15 02.2	.....
T. 34 N., R. 9 E., apparent (north) corner secs. 7 and 18, fence line east, 80 feet north of above is apparent east corner of secs. 12 and 13, T. 34 N., R. 8 E., fence line west, at center of north and south road on Grundy-Will county line	41 26 00.9	88 15 04.0	5,250
T. 34 N., Rs. 8 and 9 E., approximate corner secs. 1, 6, 7, and 12, 65 feet north of east and west road, in line with T road south, near east and west fence	41 26 53.4	88 15 05.6	5,320
Minooka station, 200 feet west of; railroad crossing, center of	41 27 17.7	88 15 41.1	3,657
Tps. 34 and 35 N., R. 8 E., quarter corner between secs. 1 and 36, on Kendall-Grundy county line; center of north and south road, at east and west fence	41 27 45.2	88 15 42.1	2,775
T. 35 N., R. 8 E., center of sec. 36; T road south	41 28 11.3	88 15 43.3	2,649
T. 35 N., Rs. 8 and 9 E., quarter corner between secs. 31 and 36; T road west on Kendall-Will County line	41 28 12.2	88 15 08.5	2,649
T. 35 N., R. 9 E., apparent west corner secs. 30 and 31, north and south road at fence east, 25 feet north of above is apparent east corner secs. 25 and 36, T. 35 N., R. 8 E., north and south road at fence west	41 28 38.2	88 15 09.4	2,635
T. 35 N., R. 8 E., quarter corner east side sec. 25; T road west	41 29 04.6	88 15 10.5	2,675
T. 35 N., R. 9 E., west corner secs. 19 and 30; T road east	41 29 30.3	88 15 11.3	2,601
T. 35 N., R. 8 E., quarter corner east side sec. 24; T road west	41 29 56.4	88 15 12.2	2,641

Along highways through center of quadrangle.

T. 33 N., R. 7 E., corner secs. 9, 10, 15, 16; T road south	41 20 35.1	88 25 17.5	.....
T. 33 N., R. 7 E., corner secs. 10, 11, 14, 15; T road south	41 20 37.0	88 24 07.9	5,314
T. 33 N., R. 7 E., about 0.25 mile west of corner of secs. 11, 12, 13, and 14; T road south	41 20 37.9	88 23 15.7	3,980
Mazon River, east end of iron truss bridge over	41 20 37.9	88 22 40.1	2,717
T. 33 N., R. 7 E., quarter corner secs. 12 and 13; T road south	41 20 38.6	88 22 23.3	1,276
T. 33 N., Rs. 7 and 8 E., corner secs. 12, 13, 7, and 18, on north side east and west road, in line with fence south, near district No. 55 schoolhouse; stone	41 20 39.6	88 21 48.2	2,681
T. 33 N., R. 8 E., corner secs. 7, 8, 17 and 18; T road south	41 20 41.0	88 20 38.9	5,289
T. 33 N., R. 8 E., apparent corner secs. 8, 9, 16, and 17, 350 feet west of, public road crossing	41 20 45.8	88 19 30.0	5,275
T. 33 N., R. 8 E., corner secs. 4, 5, 8, and 9, north and south road at east and west fence, lane east	41 21 34.6	88 19 31.0	4,931
Devine triangulation station (U. S. Corps of Engineers), about 2.5 miles southwest of Devine station on Elgin, Joliet & Eastern R. R., and 0.25 mile northwest of residence of D. E. Thomas, on the west side of the highway, 1,175 feet north and 32 feet west of the southwest corner of secs. 4, T. 33 N., R. 8 E., Goose Lake Township; marked by stone and iron pipe	41 21 46.02	88 19 31.53	1,162
T. 33 N., R. 8 E., corner secs. 9, 10, 15, and 16; T road south	41 20 43.8	88 18 20.9	5,274
Elgin, Joliet & Eastern R. R. crossing	41 20 44.6	88 17 45.8	2,680
T. 33 N., R. 8 E., corner secs. 10, 11, 14, and 15; T road south	41 20 45.3	88 17 12.0	2,575

Magnetic declination for north border of quadrangle, 3° 30′ E.; for south border, 2° 45′ E.; for east border, 3° 00′ E.; for west border, 2° 45′ E.; for center, 3° 30′ E.

PEOTONE QUADRANGLE.

Along highways near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 32 N., R. 11 E., corner of secs. 7, 8, 17, and 18; crossroads	41 15 50.1	87 59 37.2	.....
T. 32 N., R. 11 E., corner of secs. 5, 6, 7, and 8; crossroads at schoolhouse	41 16 42.6	87 59 38.4	5,320
T. 32 N., R 11 E., north corner of secs. 5 and 6; T road south, Will-Kankakee county Line	41 17 34.1	87 59 40.5	5,210
T. 33 N., R. 11 E., south corner of secs. 31 and 32; T road north	41 17 34.0	87 59 47.3	520
T. 33 N., R. 11 E., corner of secs. 29, 30, 31, and 32; crossroads	41 18 26.3	87 59 49.0	5,290
T. 33 N., R. 11 E., corner of secs. 19, 20, 29, and 30; crossroads	41 19 18.6	87 59 50.4	5,300
T. 33 N., R. 11 E., corner of secs. 17, 18, 19, and 20; crossroads	41 20 10.9	87 59 51.5	5,290
T. 33 N., R. 11 E., corner of secs. 7, 8, 17, and 18; crossroads	41 21 03.4	87 59 52.6	5,310
T. 33 N., R. 11 E., corner of secs. 5, 6, 7, and 8; crossroads	41 21 55.7	87 59 53.7	5,300
T. 33 N., R. 11 E., north corner of secs. 5 and 6, 30 feet north and 20 feet west of, on north side of east and west road at T road south; iron post stamped "Prim. Trav. Sta. No. 19, 1915, Ill."	41 22 49.6	87 59 55.0	5,450
T. 34 N., R. 11 E., south corner stone of secs. 31 and 32; T road west	41 22 51.6	87 59 59.0	370
T. 34 N., R. 11 E., north corner of secs. 4 and 5; crossroads (20 feet east of above corner is T. 35 N., R. 11 E., south corner of secs. 32 and 33)	41 28 06.2	87 59 00.7	.....
T. 35 N., R. 11 E., corner of secs. 28, 29, 32, and 33; crossroads at schoolhouse	41 28 58.3	87 59 02.1	5,?80
T. 35 N., R. 11 E., corner of secs. 20, 21, 28, and 29; T road south	41 29 50.5	87 59 04.1	5,280

Magnetic declination for west border of quadrangle $2\frac{3}{4}°$ E.

WILMINGTON QUADRANGLE.

Along highways near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 32 N., Rs. 8 and 9 E., 20 feet north and 30 feet east of corner of secs. 12, 13, 7, and 18, on county line between Grundy and Will counties, 7 feet southwest of fence corner, 3 feet west of large power-line pole; iron bench-mark post stamped "Prim. Trav. Sta. No. 22, 1914, Illinois"	41 15 35.2	88 14 45.0	.....
T. 32 N., Rs. 8 and 9 E., corner secs. 1, 2, 6, and 7; road crossing	41 16 27.6	88 14 47.1	5,308
Tps. 32 and 33 N., Rs. 8 and 9 E., corner secs. 1, 6, 31, and 36; road crossing	41 17 19.3	88 14 48.9	5,240
T. 33 N., Rs. 8 and 9 E., corner secs. 25, 30, 31, and 36; T road east	41 18 11.4	88 14 50.3	5,274
Chicago & Alton R. R. crossing	41 18 54.0	88 14 51.3	4,311
T. 33 N., Rs. 8 and 9 E., corner secs. 19 and 24; crossroads	41 19 30.0	88 14 52.1	3,650
T. 33 N., Rs. 8 and 9 E., 25 feet east and 30 feet north of intersection of roads at corner of secs. 12, 13, 7, and 18, 5 feet north of corner fence post, 2 feet from telephone pole; iron bench-mark post stamped "Prim. Trav. Sta. No. 23, 1914, Illinois"	41 20 48.8	88 14 53.8	7,985
T. 33 N., Rs. 8 and 9 E., corner secs. 1, 12, 6, and 7; T road west	41 21 40.9	88 14 55.3	5,270
Dupage River, south end of bridge over	41 21 57.3	88 14 55.6	1,660
Tps. 33 and 34 N., Rs. 8 and 9 E., fence line east; stone	41 22 32.7	88 14 56.7	3,590
Dresden Heights triangulation station (U. S. Corps of Engineers), on line of Kankakee bluffs, 3 miles south of Channahon, on land owned by Thomas Patterson, 2,415 feet east and 925 feet south of the northwest corner of sec. 31, T. 34 N., R. 9 E., Channhon Township; stone and pipe	41 23 14.86	88 14 32.24	4,656
T. 34 N., R. 9 E., quarter corner of secs 18 and 19; T road south	41 25 09.4	88 14 32.7	11,597

Magnetic declination for west border of quadrangle, 3° 00′ E.

WILMINGTON QUADRANGLE—Continued.

Along highways near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Prim. Trav. Sta. 22, 1914, Ill. (see preceding page)	41 15 35.2	88 14 45.0	.....
T. 32 N., R. 9 E., corner of secs. 7, 8, 17, and 18; crossroads	41 15 36.8	88 13 35.6	5,303
Braidwood, Chicago & Alton R. R. main track, at northwest and southeast road crossing about 800 feet southwest of depot	41 15 44.7	88 12 51.1	3,491
T. 132 N., R. 9 E., corner of secs. 8, 9, 16, and 17; crossroads	41 15 38.0	88 12 27.6	1,922
T. 32 N., R. 9 E., corner of secs. 9, 10, 15, and 16; T road south	41 15 39.4	88 11 18.7	5,260
T. 32 N., R. 9 E., corner of secs. 10, 11, 14, and 15, 10 feet east of lane south	41 15 40.4	88 10 10.3	5,220
T. 32 N., R. 9 E., corner of secs. 11, 12, 13, and 14; crossroads at schoolhouse	41 15 41.7	88 09 01.1	5,290
Ritchie, road forks, at road west on quarter-section line, just west of wagon bridge over creek	41 15 91.1	88 06 21.1	.....

Along highways through center of quadrangle.

Tps. 33 and 34 N., Rs. 10 and 11 E., corner of; T road south	41 22 49.9	88 01 08.1	.....
Tps. 33 and 34 N., R. 10 E., stone corner of secs. 1, 2, 35, and 36; crossroads	41 22 48.6	88 02 17.5	5,290
Tps. 33 and 34 N., R. 10 E., corner of secs. 2, 3, 34, and 35; crossroads	41 22 47.4	88 03 27.4	5,330
Tps. 33 and 34 N., R. 10 E., corner of secs. 3, 4, 33, and 34; crossroads	41 22 46.2	88 04 37.0	5,310
Tps. 33 and 34 N., R. 10 E., corner of secs. 4, 5, 32, and 33; crossroads	41 22 45.0	88 05 46.3	5,290
Tps. 33 and 34 N., R. 10 E., corner of secs. 5, 6, 31, and 32; crossroads	41 22 43.6	88 06 55.9	5,310
Tps. 33 and 34 N., Rs. 9 and 10 E., 20 feet south and 50 feet east of corner of, at southeast corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 20, 1915, Ill."	41 22 41.6	88 08 04.6	5,236
T. 34 N., R. 9 E., south corner of secs. 35 and 36; center of east and west road at fence north	41 22 39.4	88 09 14.6	5,346
Tps. 33 and 34 N., R. 9 E., corner of secs. 2, 3, 34, and 35; center of east and west road at north and south fence line	41 22 37.9	88 10 23.8	5,275
Tps. 33 and 34 N., R. 9 E., corner of secs. 3, 4, 33, and 34; crossroads at Blodgett	41 22 36.9	88 11 32.3	5,230
T. 34 N., R. 9 E., south corner of secs. 32 and 33; fence north	41 22 35.5	88 12 41.4	5,270
Tps. 33 and 34 N., R. 9 E., corner of secs. 5, 6, 31, and 32; T road north	41 22 34.2	88 13 50.4	5,260

Along highways near north border of quadrangle.

T. 35 N., R. 10 E., corner of secs. 21, 22, 27, and 28; T road west	41 29 42.7	88 04 50.0	.....
T. 35 N., R. 10 E., near the corner of secs. 20, 21, 28, and 29, 30 feet east of north and south section line, at southeast corner of crossroads 1,330 feet southeast of Brandon's bridge over Des Plaines River; iron post stamped "Prim. Trav. Sta. No. 22, 1915, Ill.;" elevation 582 feet	41 29 46.6	88 05 59.9	5,332
Brandon's bridge over Des Plaines River, south end of	41 29 56.8	88 06 10.9	1,331
Center of river road in line with fence on north and south section line	41 29 55.4	88 07 08.5	4,385
Center of river road at probable north and south township line, 30 feet east of railroad crossing	41 29 36.0	88 08 25.4	6,174
T road northwest	41 28 57.8	88 09 32.7	6,419
Bridge over canal, south end of	41 29 14.1	88 09 47.2	1,989
T. 35 N., R. 9 E., line between secs. 23 and 24; center of road at north and south fence line	41 29 38.4	88 09 31.7	2,725
Rock Run triangulation station, Illinois River Survey, 4 miles southwest of Joliet on top of small mound, at the north line of highway, about 500 feet west of farm buildings owned by J. Reardon, 630 feet east of the point where aforesaid highway intersects the west line of sec. 24, T. 35 N., R. 9 E., Troy Township, Will County, Ill.; established in March, 1904; marked by stone and pipe	41 29 41.8	88 09 24.1	679
T. 35 N., R. 9 E., sec. 26, on south side of road in line with road north on quarter-section line; iron post stamped "Ill. 588"	41 29 19.4	88 10 05.7	3,895
T. 35 N., R. 9 E., quarter corner between secs. 27 and 28; T road east	41 29 06.9	88 11 49.9	8,031
T. 35 N., R. 9 E., corner of secs. 21, 22, 27, and 28; T road west	41 29 33.1	88 11 50.7	2,650
T. 35 N., R. 9 E., corner of secs. 20, 21, 28, and 29; crossroads	41 29 32.6	88 13 00.0	5,270
T. 35 N., R. 9 E., corner of secs. 19, 20, 29, and 30; T road south at schoolhouse	41 29 32.0	88 14 09.6	5,300

WILMINGTON QUADRANGLE—Continued.

Along highways near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 34 N., R. 11 E., corner of secs. 29, 30, 31, and 32; crossroads at schoolhouse	41 23 43.5	88 00 00.6	
T. 34 N., R. 11 E., corner of secs. 19, 20, 29, and 30; crossroads	41 24 35.8	88 00 02.4	5,290
Manhattan, 0.75 mile west of; crossroads	41 25 15.0	88 00 03.8	3,970
T. 34 N., R. 11 E., corner of secs. 17, 18, 19, and 20; center of north and south road at east and west fence line	41 25 28.1	88 00 04.3	1,330
T. 34 N., R. 11 E., corner of secs. 7, 8, 17, and 18; T road east and road southeast	41 26 20.3	88 00 06.3	5,290
T. 34 N., R. 11 E., corner of secs. 5, 6, 7, and 8; crossroads	41 27 12.6	88 00 08.1	5,297
Tps. 34 and 35 N., R. 11 E., corner of secs. 5, 6, 31, and 32	41 28 05.0	88 00 09.4	5,300
T. 35 N., R. 11 E., corner of secs. 19, 20, 29, and 30; crossroads	41 29 49.5	88 00 13.8	

Magnetic declination for south border of quadrangle, 3° E.; for east border, 2¾° E.; for north border, 2¾° E.; through center, 2¾° E.

YORKVILLE QUADRANGLE.

Along highways near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 35 N., R. 9 E., west corner secs. 18 and 19; T road east	41 30 22.6	88 15 13.3	
T. 35 N., R. 8 E., 25 feet west of T road corners at quarter corner on west side sec. 13, 70 feet north of quarter corner on west side sec. 18, T. 35 N., R 9 E., 3 feet from north-south fence line; iron bench-mark post stamped "Prim. Trav. Sta. No. 24, 1914, Illinois"	41 30 49.5	88 15 14.0	2,717
T. 35 N., R. 8 E., at quarter corner between secs. 13 and 14; crossroads	41 30 47.7	88 16 23.8	5,319
T. 35 N., R. 8 E., at quarter corner between secs. 14 and 15; T road north	41 30 46.1	88 17 33.0	5,259
Auxsable Creek, center of iron truss bridge over	41 30 44.6	88 18 39.3	5,050
T. 35 N., R. 8 E., quarter corner between secs. 16 and 17; T road south	41 30 43.3	88 19 51.4	5,490
T. 35 N., R. 8 E., quarter corner between secs. 17 and 18, at schoolhouse; crossroads	41 30 42.2	88 20 59.9	5,210
T. 35 N., Rs. 7 and 8 E., quarter corner between secs. 13 and 18, crossroads at	41 30 41.5	88 21 56.2	4,281
T. 35 N., R. 7 E., 20 feet south and 40 feet east of crossroads, at quarter corner between secs. 13 and 14, 10 feet east of fence corner, 3 feet north of hedge line; iron bench-mark post stamped "Prim. Trav. Sta. No. 25, 1914, Illinois"	41 30 40.2	88 23 05.9	5,307
T road forks, roads north, east, and west	41 30 39.0	88 24 16.6	5,385
T. 35 N., R. 7 E., near or at quarter corner between secs. 15 and 16; center of east-west road, at hedge running north	41 30 37.0	88 25 25.5	5,246
T. 35 N., R. 7 E.; center of sec. 16, T road forks north, south, and east	41 30 36.2	88 26 01.7	2,750
Road crossing about 1,670 feet north of above forks	41 30 52.6	88 26 01.1	1,670
Intersection of highway and "The Fox" and Illinois Union Ry. Co. tracks	41 30 52.4	88 26 01.9	70
Fork in road, at point in line with road west, roads northeast, southwest, and west	41 30 35.0	88 26 53.3	4,285
T. 35 N., R. 7 E., apparent quarter corner between secs. 17 and 18; center of east and west road, at hedge south and fence north	41 30 33.5	88 27 44.3	3,886
T. 35 N., Rs. 6 and 7 E., at southeast corner of intersection of crossroads; iron bench-mark post stamped "Prim. Trav. Sta. No. 10, 1912"	41 30 31.4	88 28 59.0	5,685

Magnetic declination for south border of quadrangle, 3° 30′ E.

Campbell Hill quadrangle.

JACKSON COUNTY.

The following positions were determined by J. H. Wilson in 1915. The line begins at Ava and was run westward along public roads to O'Harrah triangulation station of the Mississippi River Commission.

CAMPBELL HILL QUADRANGLE.

Along public roads.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Ava, at west edge of town, T. 7 S., R. 4 W., quarter corner between secs. 25 and 26; T road east at	37 53 18.5	89 30 16.8	.....
T. 7 S., R. 4 W., center of east-west road at lane south, also lane north through gate, approximate corner of secs. 26, 27, 34, and 35	37 52 53.6	89 31 23.6	5,920
Forks of road on north-south quarter-section line through sec. 34	37 52 47.7	89 31 56.8	2,734
Little Kincaid Creek, center of ford at	37 52 35.7	89 32 39.2	3,609
T. 7 S., R. 4 W., quarter corner between secs. 32 and 33, right-angle bend in road at second-class road southwest	37 52 27.4	89 33 37.2	4,724
T. 7 S., R. 4 W., in sec. 30, crossroads, 20 feet northwest of oak tree with advertising signs	37 53 05.2	89 34 58.6	7,550
T. 7 S., R. 5 W., in sec. 36, T road east on north-south road on quarter-section line	37 52 51.8	89 36 23.0	6,907
T. 7 S., R. 5 W., in center of sec. 35, T road south	37 52 32.2	89 37 28.9	5,650
T. 7 S., R. 5 W., on south side of sec. 35, quarter corner in line with road north and road west, 40 feet east of above is fence south at probable quarter corner on north side of sec. 2	37 52 06.3	89 37 30.6	2,630
Degonia, southwest corner of T road south at, 2 feet east of corner of paling fence; iron post stamped "Prim. Trav. Sta. No. 10, 1915"	37 51 41.5	89 37 48.6	2,890
T. 8 S., R. 5 W., line between secs. 2 and 11, center of north-south road, fence line east	37 51 15.2	89 37 48.3	2,670
T. 8 S., R. 5 W., SE. ¼ sec. 10, road forks at road west, Dilday's mail box	37 50 31.6	89 38 14.1	4,873
Sec. 15, north part of, where road crosses top of ridge, opposite small white house, mail box on south edge of road	37 50 19.0	89 38 46.6	2,896

Brownfield, Dongola, Equality, Fords Ferry, Golconda, Joppa, Marion, Mound City, Paducah, Stonefort, and Vienna quadrangles.

HARDIN, JOHNSON, MASSAC, PIKE, PULASKI, AND SALINE COUNTIES.

The following geographic positions on Henderson, Ky., astronomic datum were determined by C. B. Kendall in 1913 and J. H. Wilson in 1915. Lines were based on positions of primary traverse station No. 34, 1908, at Peters Creek store, described in Bulletin 440, on primary traverse stations Nos. 8 and 10, 1911, described in Bulletin 551, and on United States Corps of Engineers triangulation points at Elizabethtown, Bay City, Golconda, and Grand Chain Landing. Control for Brownfield, Equality, Fords Ferry, Golconda, Paducah, and Stonefort quadrangles was done by Kendall in 1913; that for Mound City quadrangle by Wilson in 1915; and that for Marion and Vienna quadrangles by Kendall in 1913 and Wilson in 1915.

BROWNFIELD QUADRANGLE.

Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Three corners, public T road east, center of north-south road at, 10 feet northwest to dead oak, 10 feet southeast to center of triangle	37 29 17.2	88 30 37.6	.....
Three corners, public T road west, center of north-south road at, 15 feet west to mail box No. 60, in center of triangle	37 29 07.0	88 30 37.6	1,030
Second-class T road north at corner of orchard	37 28 58.4	88 31 10.7	2,804
T. 12 S., R. 6 E., corner secs. 10, 11, 14, and 15 (this point is within a very few feet of the above corner)	37 29 06.6	88 31 25.6	1,457
Lusk Creek, 200 feet south of Rose Ford, 25 feet north to sycamore tree, 25 feet east to elm tree, fork in road to south and southeast.	37 29 15.2	88 32 04.8	3,279
T. 13 S., R. 6 E., 0.25 mile east of corner secs. 3, 4, 9, and 10; stone corner	37 29 56.9	88 32 18.2	4,363
T. 12 S., R. 6 E., quarter corner between secs. 5 and 8; crossroads, second-class road north and south	37 29 54.5	88 34 12.4	.....
T. 12 S., R. 6 E., quarter corner between secs. 6 and 7; cross fences	37 29 54.3	88 35 18.3	.....
T. 12 S., R. 5 E., stone 0.25 mile west of corner secs. 2, 3, 10, and 11 (set by county surveyor)	37 29 54.0	88 38 25.4	.....
Three corners, public T road west, 15 feet west to center of triangle.	37 29 34.1	88 38 25.4	2,012
L. A. Walter's mail box in center of triangle at public road fork northwest	37 28 44.6	88 39 06.3	5,994
T. 12 S., R. 5 E., 0.25 mile north of corner secs. 15, 16, 21, and 22, corner on north and south section line	37 28 23.1	88 39 14.1	2,263
T. 12 S., R. 5 E., quarter corner between secs. 16 and 21, public T road south and second-class road west, 8 feet southwest to corner fence post, 18 feet north to old stump	37 28 10.4	88 40 03.2	4,162
T. 12 S., R. 5 E., stone corner secs. 16, 17, 20, and 21; stone is in woods 40 feet southwest of the southwest corner of clearing, on south side of road at bend to south	37 28 11.0	88 40 36.2	2,667
Big Bay Creek, center of iron bridge over	37 28 50.4	88 41 24.7	5,579
Big Bay Creek, 75 feet northwest of ford in forks of road; large sycamore tree	37 29 20.4	88 41 25.5	3,045
Three corners, 400 feet northwest of church; public T road south, 50 feet south to oak, 35 feet southeast to oak	37 29 39.6	88 41 56.9	3,184
T. 12 S., Rs. 4 and 5 E.; stone quarter corner between secs. 12 and 7, also line between Pope and Johnson counties	37 29 29.2	88 42 33.3	3,115
Three corners; public T road north, center of east and west road at, 12 feet southwest to two mail boxes	37 29 28.2	88 43 14.2	3,305
T. 12 S., R. 4 E., quarter corner between secs. 11 and 12, on south edge of road opposite fence north, and about 200 feet east of new house	37 29 27.6	88 43 39.4	2,031
Four corners, near top of hill; public crossroads, 5 feet west to oak stump, 50 feet southwest to center of bushy triangle, 20 feet north to center of triangle	37 29 16.8	88 44 09.4	2,655

Along highways through center of quadrangle.

Grantsburg, 30 feet west of west end of bridge over Big Bay Creek; public T road south, center of east-west road at	37 23 31.3	88 44 43.1	.....
Grantsburg, 0.75 mile east of; center of east-west road at public T road south, 10 feet south to center of triangle, 15 feet north to oak	37 23 09.6	88 43 57.9	4,263
T. 13 S., R. 4 E., 720 feet north of center of sec. 13; center of intersection of public crossroads	37 23 23.5	88 43 08.8	4,199
T. 13 S., Rs. 4 and 5 E.; stone at east corner secs. 12 and 13, on north-south line between Johnson and Pope counties	37 23 47.8	88 42 34.3	3,714
T. 13 S., R. 5 E., 0.25 mile east of center of sec. 18, 80 feet east of public T road south, 25 feet north to maple tree in yard, 10 feet south to center of triangle	37 23 15.5	88 41 49.0	4,909
Dixon Springs, 0.75 mile southwest of, three corners, public T road north; center of triangle	37 22 57.2	88 40 38.7	5,976
T. 13 S., R. 5 E., corner secs. 16, 17, 20, and 21, at corner of fence south and west (position is within a few feet of true corner)	37 22 59.0	88 40 26.6	990
Dixon Springs; center of spring No. 1 ("Old Ironsides")	37 23 04.7	88 40 09.6	1,487
Dixon Springs, 1 mile southeast of; center of east-west road, at public T road north, 25 feet northwest to oak in triangle, 75 feet east of small stream, three corners	37 22 22.4	88 39 54.2	4,457
Allens Spring post office, intersection of crossroads at	37 22 12.4	88 39 21.0	2,869
Three corners; center of east-west road at public T road north, 25 feet north to center of triangle, 15 feet south to old stump, 25 feet southwest to oak tree	37 22 02.6	88 38 34.9	3,855
T. 13 S., R. 5 E.; post at corner of secs. 22, 23, 26, and 27, post in corner of fences south and west, 420 feet north of public T roads south	37 21 58.6	88 38 15.2	1,642
T. 13 S., R. 5 E., 1,350 feet south of corner secs. 23, 24, 25, and 26, 25 feet south and 20 feet west of intersection of roads, 5 feet north of corner of wire (and rail) fence; iron post stamped "Prim. Trav. Sta. No. 9, 1913, Illinois"	37 21 44.8	88 37 09.8	5,464

BROWNFIELD QUADRANGLE—Continued.

Along highways through center of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Three corners; public T road south, at north edge of east-west road, 30 feet south to center of bridge over creek	37 21 35.1	88 36 04.0	5,398
T. 13 S., Rs. 5 and 6 E.; stone corner secs. 25, 30, 31, and 36, 3,010 feet south of public T road south on range line, on west edge of north-south road, at fence corner	37 21 05.4	88 36 04.0	3,012
Old Brownfield, three corners at, public T road north, 5 feet north to center of triangle	37 21 36.4	88 35 43.1	3,563
T. 13 S., R. 6 E., 3,970 feet south of corner secs. 17, 18, 19, and 20	37 22 11.9	88 34 56.8	5,185
T. 13 S., R. 6 E., corner secs. 17, 18, 19, and 20; center of north-south road at public T road east	37 22 51.2	88 34 56.6	3,970
T. 13 S., R. 6 E., corner secs. 16, 17, 20, and 21, 10 feet north and 25 feet east of center of main road at T road east, 200 feet south of Walter Bros.' store at Waltersburg	37 22 40.2	88 33 48.1	5,527
Waltersburg, 1.3 miles southeast of, three corners, 100 feet east of bridge over small creek, 15 feet north to wheel with 4 mail boxes; center of main road at second-class T road north	37 22 13.0	88 32 36.9	6,822
T. 13 S., R. 6 E., 550 feet north of corner secs. 22, 23, 26, and 27; center of main road, at second-class T road north	37 21 58.6	88 31 30.5	4,857

Along highways near east border of quadrangle.

T. 13 S., R. 6 E.; center of sec. 36, 100 feet northeast of Fairview schoolhouse, oak tree in center of triangle at public T road south.	37 20 40.5	88 30 01.1	.....
T. 14 S., R. 6 E., north quarter corner sec. 1, oak tree in center of second-class T road east; 60 feet east of the above is south quarter corner sec. 36, T. 13 S., R. 6 E.	37 20 11.6	88 30 00.4	2,923
T. 14 S., R. 6 E.; stone corner secs. 1, 2, 11, and 12, center of crossroads, at 90° angle in main road to west, second-class road south and east	37 19 17.8	88 30 33.6	6,064
Three corners; center of main road at T road east, 15 feet east to center of triangle, 15 feet north to 6 mail boxes on wheel	37 18 46.4	88 31 45.7	6,627
T. 14 S., R. 6 E., stone quarter corner, between secs. 10 and 15, west edge of north-south road at center of T road west at store at Old Tonsio post office	37 18 25.4	88 32 13.6	3,103
T. 14 S., R. 6 E., 0.75 mile south of quarter corner between secs. 10 and 15; center of north-south road in line with center of public T road west, 25 feet west to center of clump of bushes in triangle	37 17 45.9	88 32 14.3	3,991
T. 14 S., R. 6 E., 570 feet east of quarter corner between secs. 22 and 23; three corners public T road south, 10 feet southwest to center of triangle, 28 feet east to persimmon tree	37 17 05.0	88 31 34.0	5,265
Bay Creek, center of iron bridge over	37 16 32.4	88 31 28.2	3,333
T. 14 S., R. 6 E., 1,330 feet south and 20 feet east of corner secs. 26, 27, 34, and 35, 20 feet north and 15 feet east of center of public crossroads, in corner of wire fence; iron post stamped "Prim. Trav. Sta. No. 6, 1913, Illinois"	37 15 32.4	88 31 41.3	6,152

Along highways near south border of quadrangle.

T. 14 S., R. 6 E., on line between secs. 27 and 34, three corners public T road west, 15 feet west to center of triangle, 20 feet south to mail box	37 15 45.3	88 32 31.4	4,257
T. 14 S., R. 6 E., 0.25 mile west of corner secs. 27, 28, 33, and 34; stone on north edge of road	37 15 45.4	88 33 05.0	2,720
T. 14 S., R. 6 E., 0.25 mile west of corner secs. 28, 29, 32, and 33; center of north-south road, at public T road east, 5 feet east to center of triangle	37 15 45.6	88 34 11.7	5,390
Forks public road southwest, second-class road west, 23 feet south to stump, 10 feet northwest to mail box	37 15 46.5	88 34 49.7	3,072
T. 14 S., R. 6 E., stone corner secs. 29, 30, 31, and 32, 1,000 feet west of forks public road southwest, second-class road west	37 15 46.7	88 35 01.7	970
Tps. 14 and 15 S., R. 6 E., 0.25 mile north and 0.25 mile east of corner secs. 1, 6, 31, and 36; stone on south edge of east-west road and 25 feet west of second-class T road south	37 15 08.5	88 35 49.7	5,478
Tps. 14 and 15 S., R. 5 E., 210 feet west of south corner sec. 33, on north edge of east-west road at public T road south, is north quarter corner of sec. 4	37 15 00.2	88 39 59.0	.....
Massac Creek, 1,160 feet west of concrete bridge over, in southeast corner of public crossroads; large poplar snag	37 15 01.8	88 40 52.2	4,299
Tps. 14 and 15 S., R. 5 E., north corner secs. 5 and 6, 160 feet west of concrete bridge over small creek; center of east-west road at fence south	37 15 02.8	88 41 39.2	3,809
Tps. 14 and 15 S., Rs. 4 and 5 E., 400 feet west of corner secs. 1, 6, 31, and 36; public crossroads, 20 feet, southeast to oak, 20 feet northwest to telephone pole	37 15 03.0	88 42 41.7	5,050

BROWNFIELD QUADRANGLE—Continued.

Along highways near south border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Tps. 14 and 15 S., R. 4 E., corner secs. 1, 2, 35, and 36; center of east-west road at second-class T road north and drainage ditch south	37 15 03.0	88 43 42.3	4,900
Round Knob, 1 mile northwest of; center of north-south road at public T road west (may be quarter corner between secs. 34 and 35, T. 14 N., R. 4 E.)	37 15 30.0	88 44 59.6	.....

Along highway near southwest corner of quadrangle (spur line to Army engineers' bench mark at Bay City and is not adjusted).

Bay City, about 1 mile west of, wooden bridge over Cave Creek, center of	37 15 26.1	88 30 50.2	.....
Bay City, about 0.80 mile west of; center of iron bridge over Barn Creek	37 15 21.7	88 30 38.8	1,016

Along highways near west border of quadrangle.

T. 13 S., R. 4 E., corner secs. 26, 27, 34, and 35, intersection of public crossroads, 35 feet southwest to corner wire fence, 45 feet southeast to oak tree	37 21 03.0	88 44 45.9	.....
T. 13 S., R. 4 E., stone corner secs. 22, 23, 26, and 27, in center of north and south road, at wire fence west	37 21 56.0	88 44 45.9	5,358
T. 13 S., R. 4 E., 210 feet south of approximate corner secs. 14, 15, 22, and 23, three corners at bridge over creek, center of old north-south road, 25 feet west to center of new road, 35 feet north to center of creek	37 22 46.3	88 44 47.2	5,090

Magnetic declination for north border of quadrangle, 4° 37′ E.; for south border, 4° 23′ E.; for east border, 4° 27′ E.; for west border, 4° 23′ E.; for center, 4° 25′ E.

DONGOLA QUADRANGLE.

Along Big Four and Chicago & Eastern Illinois railroads and highways near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 14 S., R. 2 E., crossroads 350 feet south of corner of secs. 28, 29, 32, and 33	37 15 30.7	89 00 13.9	.....
Grand Chain, at fence corner 18 feet north of stock pen, on the west side of track, 180 feet north of depot; iron post stamped "Prim. Trav. Sta. No. 15, 1915, Ill. Elev. 405"	37 15 13.5	89 01 11.0	4,932
Second-class road crossing just north of milepost 237	37 16 13.8	89 00 04.5	8,135
Rago, railroad crossing, 380 feet west of west end of bridge over Cache River	37 18 45.3	89 00 30.0	.....
Whitehill, railroad crossing, main track	37 19 12.2	89 01 16.1	4,612
Joppa Junction, main track of railroad at line between secs. 6 and 31, Tps. 13 and 14 S., R. 2 E., 10 feet south of center of east and west road crossing	37 19 52.2	89 01 36.3	4,362
T. 13 S., R. 2 E., railroad at line between secs. 29 and 32	37 20 45.5	89 01 18.0	5,585
East-west road crossing	37 20 58.7	89 01 13.5	1,389
T. 13 S., R. 2 E., center of main track of railroad at line between secs. 20 and 29, 70 feet north of railroad crossing	37 21 37.8	89 01 00.2	4,101
Cypress, main track in front of window of telegraph office	37 21 53.3	89 00 54.9	1,619
T. 13 S., R. 2 E., line between secs. 16 and 17, bend in road 0.25 mile north of corner of secs. 16, 17, 20, and 21	37 22 46.2	89 00 08.1	6,558
Cypress, railroad crossing, 180 feet southeast of yard limit sign	37 22 45.3	89 00 41.1	2,662
Cypress, 1 mile north of, at the southeast corner of crossroads, 3 feet east of C. A. Davidson's mail box and 20 feet east of section line, 0.25 mile north of corner of secs. 17, 18, 19, and 20, T. 13 S., R. 2 E.; iron post stamped "Prim. Trav. Sta. No. 12, 1915, Ill."	37 22 44.4	89 01 13.6	2,631
T. 13 S., R. 2 E., corner of secs. 17, 18, 19, and 20	37 22 31.3	89 01 13.9	1,325
T. 13 S., R. 2 E., corner of secs. 7, 8, 17, and 18; center of north and south road at fence west	37 23 23.2	89 01 13.6	5,255
Crossroads at Mount Pisgah schoolhouse	37 24 04.0	89 01 13.0	4,124

DONGOLA QUADRANGLE—Continued.

Along Big Four and Chicago & Eastern Illinois railroads and highways near east border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 13 S., R. 2 E., corner of secs. 5, 6, 7, and 8	37 24 17.2	89 01 12.8	1,345
Crossroads	37 24 21.5	89 02 12.6	4,840
Crossroads	37 24 44.6	89 02 12.3	2,340
Tps. 12 and 13 S., R. 2 E.; center of north and south road at line between secs. 6 and 31	37 25 13.6	89 02 12.2	2,930
T. 12 S., R. 2 E., quarter corner between secs. 30 and 31; center of north and south road at fence, 50 feet north of bridge over creek. NOTE.—West half of section is long; east half correct.	37 26 07.1	89 01 45.5	5,832
Pleasant Grove, crossroads, 25 feet southwest of oak tree	37 26 31.4	89 01 45.6	2,455
T. 12 S., R. 2 E., quarter corner between secs. 19 and 30; center of north and south road in line with fence east	37 27 00.1	89 01 46 0	2,905
T road south, line between secs. 18 and 19; northwest corner of wooden culvert	37 27 53.6	89 01 24.3	5,690
North end of bridge over Cache River	37 28 14.1	89 01 37.5	2,331
T. 12 S., R. 2 E., stone quarter corner between secs. 7 and 18, 100 feet north of T road east and 12 feet east of mail box No. 29	37 28 46.1	89 01 45.9	3,305
Elvira schoolhouse, 30 feet north of road forks; iron post stamped "Prim. Trav. Sta. No. 13, 1915, Ill."	37 29 36.9	89 01 49.5	5,144
T. 12 S., R. 2 E., quarter corner between secs. 6 and 7, T lane north.	37 29 39.6	89 01 46.1	389
T. 12 S., R. 2 E., corner of secs. 5, 6, 7, and 8; center of east and west road at north and south fence line	37 29 39.9	89 01 12.6	2,699
T road north	37 29 41.6	89 00 22.9	4,010
T. 12 S., R. 2 E., corner of secs. 4, 5, 8, and 9; fence corner 1,330 feet east of T road north	37 29 42.8	89 00 06.5	1,330

Magnetic declination for quadrangle, 4¾° E.

EQUALITY QUADRANGLE.

Along public roads.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Lusk, 1.5 miles northwest of; three corners at top of hill, public T road west, 55 feet west to three mail boxes, 10 feet northwest to center of triangle, 60 feet north to oak tree	37 30 28.0	88 28 36.7	.....
Hartsville, 0.25 mile south of, 300 feet northeast of church; public T road south, 30 feet south to center of triangle, 5 feet northeast to corner fence	37 31 53.0	88 28 57.4	8,763
Hartsville, three corners; public T road east, 20 feet east to center of triangle	37 32 25.8	88 28 54.9	3,326
Three corners, 300 feet south of church; second-class T road south, 15 feet south to center of plank bridge	37 32 45.1	88 29 11.8	2,380
T. 11 S., Rs. 6 and 7 E., stone corner secs. 19, 24, 25, and 30; stone is in center of lane 60 feet east of dwelling and about 1,200 feet south of T road south	37 32 33.3	88 29 11.5	1,190
Ford of Little Lusk Creek, 500 feet northwest of; second-class T road north, center of triangle at	37 33 10.7	88 29 53.8	5,096

Magnetic declination for south border of quadrangle, 4° 43′ E.; for southwest half, 4° 44′ E.

FORDS FERRY QUADRANGLE.

At Peters Creek.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Peters Creek store, 1,500 feet north of, on north edge of public road 200 feet east of 90° bend to east; iron post stamped "Prim. Trav. Sta. No. 34, 1908, Illinois"	37 29 37.8	88 14 05.6	.....
Peters Creek store, 1,400 feet west of; public T road south, 5 feet south to center of triangle	37 29 21.6	88 14 24.5	2,230

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GOLCONDA QUADRANGLE.

Along public roads.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 12 S., R. 9 E., west corner secs. 7 and 18; stone in center of second-class road at T fence east	37 28 58.1	88 15 49.5	
NOTE.—100 feet north of the above is T. 12 S., R. 8 E., corner secs. 12 and 13.			
Three corners; public T road north, 5 feet north to center of triangle	37 28 40.7	88 16 23.0	3,222
Bassett schoolhouse, 0.5 mile east of, 20 feet east of public T road north and 125 feet north of brick house; stone on south edge of east and west road	37 28 04.6	88 17 13.5	5,462
Bassett schoolhouse, 400 feet west of, three corners; second-class T road west, 50 feet north of public fork east	37 28 04.8	88 17 46.9	2,690
T. 12 S., R. 8 E., stone corner sections 14, 15, 22, and 23; stone is in center of east-west second-class road, 1,700 feet west of Bassett schoolhouse	37 28 04.8	88 18 04.2	1,400
Elizabethtown, Hardin County courthouse; center of front or south door	37 26 54.3	88 18 13.8	7,167
Elizabethtown, on limestone point on bank of river, directly in front of the Rose House, 5 feet west of summer house; a triangle and letters "U. S." cut in solid rock, "U. S. Engineers' Base line triangulation station"	37 26 46.2	88 18 11.8	835
NOTE.—The engineers' position for this point is (U. S. standard datum): Latitude, 37° 26′ 41.746″; longitude, 88° 18′ 15.349″. Difference: Latitude, 4.45″; longitude, 3.55″.			
Elizabethtown, 0.6 mile northwest of; stone at T road north said to be quarter corner between secs. 22 and 27, T. 12 S., R. 8 E.	37 27 10.6	88 18 38.2	3,265
T. 12 S., R. 8 E., stone corner secs. 21, 22, 27, and 28; stone is at fence corner on telephone line, about 670 feet west of 45° bend in road to northwest	37 27 10.6	88 19 11.1	2,648
Big Creek, center of iron bridge over	37 27 14.0	88 19 26.7	1,304
Stone Church, three corners opposite public T road north, 10 feet west to telephone pole, 35 feet east to center of triangle	37 27 10.8	88 20 36.9	5,674
NOTE.—130 feet east of the above is an old engine cylinder buried in center of east-west road and may be one-sixteenth corner between the SE. ¼ sec. 20 and NE. ¼ sec. 29, T. 12 S., R. 8 E.			
T. 12 S., R. 8 E., quarter corner secs. 19 and 20, at second-class T road north and wire fence south, 10 feet northwest to three mail boxes	37 27 37.0	88 21 26.2	4,783
T. 12 S., R. 8 E., stone center sec. 19, on south edge of road at second-class T road north, 100 feet east of top of hill	37 27 37.3	88 22 00.2	2,740
T. 12 S., R. 8 E., west corner secs. 18 and 19, about 1,000 feet south of, 50 feet west of range line between secs. 19 and 24, on the north edge of east-west road opposite and in line with public T road south and 40 feet north of center of triangle; iron post stamped "Prim. Trav. Sta. No. 1, 1913, Illinois"	37 27 54.7	88 22 38.2	3,533
T. 12 S., R. 8 E., west corner secs. 18 and 19 at T fence east	37 28 04.6	88 22 37.4	1,005
NOTE.—20 feet north of the above is T. 12 S., R. 7 E., corner of secs. 13 and 24, at T fence west.			
T. 12 S., R. 7 E., east corner secs. 13 and 24, about 0.6 mile northwest of; three corners public T road west, 20 feet southwest to four mail boxes, 25 feet northwest to corner wire fence	37 28 32.6	88 22 53.6	3,122
T. 12 S., R. 7 E., quarter corner between secs. 13 and 14, 660 feet south of; three corners second-class T road north, 15 feet north to oak, 30 feet southwest to telephone pole	37 28 26.0	88 23 42.6	4,003
NOTE.—660 feet north and 25 feet west of the above is within a few feet of T. 12 S., R. 7 E., quarter corner between secs. 13 and 14, at gate on east edge of road.			
T. 12 S., R. 7 E., corner secs. 10, 11, 14, and 15, 1,560 feet south of, four corners on Pope-Hardin county line; second-class cross-road	37 28 30.8	88 24 48.2	5,313
NOTE.—1,560 feet north of the above is T. 12 S., R. 7 E., corner secs. 10, 11, 14, and 15.			
Bridge over Grand Pierre Creek, 0.6 mile east of; three corners public T road south, center of triangle at	37 28 55.5	88 25 46.3	5,313
NOTE.—555 feet north and 620 feet west of the above is T. 12 S., R. 7 E., corner secs. 9, 10, 15, and 16; corner is said to be on north-south yard fence on line between kitchen and smokehouse of residence of Mr. Shetler, about 0.5 mile east of Grand Pierre Creek.			
Bridge over Grand Pierre Creek, 400 feet west of; forks of public roads northwest and southwest, 5 feet north to center of triangle, 15 feet southwest to two mail boxes	37 29 04.4	88 26 27.0	3,398
Bridge over Grand Pierre Creek, 0.8 mile west of; fence corner 300 feet north of public road and may be T. 12 S., R. 7 E., corner secs. 8, 9, 16, and 17	37 28 56.8	88 27 09.0	3,472
T. 12 S., R. 7 E., stone corner secs. 7, 8, 17, and 18; stone is at corner of picket fence on south edge of road 1,200 feet east of cross-roads at Lusk	37 29 02.6	88 28 08.2	4,814

GOLCONDA QUADRANGLE—Continued.

Along public roads—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Lusk, store and post office, 50 feet east and 20 feet north of the northeast corner of, 220 feet north of crossroads, on east edge of north and south roads, at the southwest corner of Mrs. Lucy Barger's front yard; iron post stamped "Prim. Trav. Sta. No. 2, 1913, Illinois"	37 29 04.8	88 28 22.8	1,190
Lusk, 0.75 mile north of; three corners public T roadwest, mail box at telephone pole in center of triangle	37 29 42.8	88 28 10.0	3,992

Magnetic declination for north border of quadrangle, 4° 43′ E.

Along highways near north border of quadrangle.

T. 12 S., Rs. 6 and 7 E., corner secs. 7, 12, 13, and 18, three corners; center of east and west road at second-class T road south	37 29 02.5	88 29 15.2	.....
Lusk, 1.2 miles west of center of triangle at three corners; public T road north, 50 feet east of ford of Little Grand Pierre	37 29 02.5	88 29 36.9	1,745

Along highways near west border of quadrangle.

Golconda, at south edge of forks of public roads south and southwest, 60 feet north to oak tree, 60 feet southwest to oak tree	37 21 39.3	88 29 23.2	.....
Golconda, in Pope County courthouse yard, west and south of north gate, U. S. Corps of Engineers' bench-mark post, stamped "891" (Henderson astronomic datum)	37 22 04.7	88 29 02.0	3,085
NOTE.—The position of the above on approximate United States standard: Latitude, 37° 22′ 01.2″; longitude, 88° 29′ 03.8″.			
Golconda, in northwest corner of courthouse yard and 71 feet northwest of U. S. Corps of Engineers' bench mark, in center of triangle formed by supports of city fire bell; iron post stamped "Prim. Trav. Sta. No. 10, 1913, Illinois"	37 22 05.0	88 29 02.8	71
Golconda, at north edge of town; center of iron bridge over Lusk Creek	37 22 20.9	88 29 13.3	1,821
T. 13 S., Rs. 6 and 7 E., stone corner secs. 13, 18, 19, and 24; corner in pile of stones at wire and picket fence corner at old north and south road and telephone line	37 22 53.2	88 29 20.9	3,317
Forks at top of hill, public roads north and northeast center of triangle at	37 23 12.2	88 29 20.6	1,920
T. 13 S., Rs. 6 and 7 E., corner secs. 7, 12, 13, and 18; center of road opposite hedge north and east	37 23 46.1	88 29 20.4	3,426
T. 13 S., Rs. 6 and 7 E., corner secs. 1, 6, 7, and 12; center of main road, 25 feet south of T lane west to barn with cupola	37 24 38.6	88 29 19.6	5,310
T. 12 and 13 S., Rs. 6 and 7 E., stone corner secs. 1, 6, 31, and 36, at fence corner in northwest corner of pasture and about 700 feet west of public road	37 25 31.4	88 29 18.5	5,342
Little Grand Pierre Creek, 700 feet west of ford at; stone in center of triangle at second-class road west and 45° bend in main road to northeast	37 26 10.7	88 28 54.0	4,437
T. 12 S., R. 7 E., quarter corner between secs. 30 and 31 (?); center of road at east and west fence	37 26 24.0	88 28 44.4	1,552
Gowen's store, 125 feet south of; fork in roads, public roads north and northeast, 30 feet southeast to northwest corner shop, 60 feet northwest to front gate	37 26 38.4	88 28 36.6	1,577
T. 12 S., R. 7 E., corner secs. 29, 30, 31, and 32, on east and west fence row, 0.5 mile southeast of store at "Gowens"	37 26 24.1	88 28 10.9	2,529
T. 12 S., R. 7 E., stone quarter corner between secs. 19 and 20, in corner of cross fences	37 27 43.3	88 28 09.9	8,010
Lusk, about 1 mile south of, 810 feet west of corner secs. 17, 18, 19, and 20, T. 12 S., R. 7 E., three corners; center of north and south road at public T road east; 5 feet northeast to center of triangle, 12 feet southeast to wire fence corner	37 28 09.8	88 28 19.6	2,788
Lusk, on east edge of north and south road at the southwest corner of Mrs. Lucy Bayers' front yard, 50 feet east and 20 feet north of the northeast corner of store and 220 feet north of crossroads; iron bench-mark post stamped "Prim. Trav. Sta. No. 2, 1913, Illinois"	37 29 04.8	88 28 22.8	5,559
Bay City, 70 feet north of Glass's store, 30 feet west of center of north-south road; U. S. Corps of Engineers' bench-mark post (Henderson astronomic datum)	37 15 03.1	88 29 47.6	.....
NOTE.—The position of above on approximate United States standard: Latitude, 37° 14′ 59.6″; longitude, 88° 29′ 50.4″.			

Magnetic declination for west border of quadrangle 4° 27′ E.

JOPPA QUADRANGLE.

Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Center of east and west road, just north of telephone pole with signboard; road east, west, southeast, and southwest	37 14 30.3	88 59 58.1	
U. S. Corps of Engineers' bench mark 46, Grand Chain Landing, about 300 feet above shore end of current deflecting crib and rock dike and about 60 feet below, near corner of white frame house, on slope of hill, about 150 feet back from top of river bank, in small ravine at corner of orchard and about 25 feet from riverside corner of shed and privy respectively; top of cap of 2-inch galvanized pipe	37 13 44.0	88 59 37.6	4,966
Tps. 14 and 15 S., Rs. 2 and 3 E., corner of; center of north-south road on county line at fence east	37 14 51.3	88 55 41.3	
Crossroads on ridge, north-south road on Pulaski-Massac county line	37 14 32.3	88 55 40.6	1,926
Crossroads, 290 feet west of line between secs. 5 and 6, T. 15 S., R. 3 E	37 14 38.3	88 54 43.4	4,666
T. 15 S., R. 3 E., road north on line between secs. 4 and 5, just north of schoolhouse	37 14 24.6	88 53 37.4	5,514
Hillerman, T road east	37 14 13.8	88 53 21.5	1,688
T. 15 S., R. 3 E., corner of secs. 3, 4, 9, and 10; center of east-west road at north-south fence line	37 14 13.1	88 52 32.5	3,965
T. 15 S., R. 3 E., corner of secs. 2, 3, 10, and 11; crossroads	37 14 11.9	88 51 26.2	5,360
T. 15 S., R. 3 E., in SW. ¼ sec. 2, 50 feet east and 25 feet north of Chicago & Eastern Illinois R. R. at east-west road crossing; iron post stamped "Prim. Trav. Sta. No. 16, 1915, Ill."	37 14 20.1	88 51 05.1	1,902
T. 15 S., R. 3 E., road south on line between secs. 1 and 2	37 14 23.6	88 50 20.8	3,603
Tucker schoolhouse, 530 feet north of; wooden culvert at crossroads, line between secs. 1 and 6, T. 15 S., Rs. 3 and 4 E	37 14 17.0	88 49 15.0	5,362
T. 15 S., R. 4 E., stone quarter corner between secs. 5 and 8	37 14 10.5	88 47 31.2	8,419

Magnetic declination for quadrangle, 4¼° E.

MARION QUADRANGLE.

Along highways near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 12 S., R. 4 E., stone quarter corner between secs. 3 and 4, 1,000 feet north of J. F. Russell's house, 5 feet north of corner rail fence at 90° angle in road to west	37 30 32.1	88 45 49.7	
Tps. 11 and 12 S., R. 4 E., within a few feet of quarter corner between secs. 4 and 33 (corner could not be found)	37 30 46.9	88 46 22.4	3,030
Tps. 11 and 12 S., R. 4 E., 0.25 mile north and 1,900 feet east of corner secs. 4, 5, 32, and 33, three corners at Reynoldsburg, at northeast corner of triangle, 20 feet west of north-south road; iron bench-mark post stamped "Prim. Trav. Sta. No. 4, 1913, Ill."	37 30 58.8	88 46 30.7	1,388
Reynoldsburg, 1.3 miles northeast of; three corners, public T road west, at center of north-south road, 10 feet west to center of triangle, 20 feet northwest to elm tree	37 32 00.2	88 46 19.7	6,267
T. 11 S., R. 4 E., quarter corner between secs. 21 and 28, 0.5 mile west of Ozark intersection of public crossroads	37 32 33.6	88 46 19.7	3,390
T. 11 S., R. 4 E., stone in center of sec. 21, on north edge of east and west road at public T road south	37 32 59.2	88 46 19.7	2,689
T. 11 S., R. 4 E., stone corner secs. 15, 16, 21, and 22, in center of intersection of second-class crossroads	37 33 25.2	88 45 45.8	3,714
T. 11 S., R. 4 E., stone corner secs. 9, 10, 15, and 16, at junction of east-west wire fence and T fence south	37 34 27.8	88 46 19.2	6,883
New Burnside station, 300 feet east of; center of main track Big Four R. R. at north-south road crossing	37 34 51.5	88 46 16.9	2,414
T. 11 S., R. 4 E., stone quarter corner between secs. 4 and 9, 15 feet northwest of center of second-class east-west crossroad	37 35 13.1	88 46 19.0	2,195
Tps. 10 and 11 S., R. 4 E., 25 feet east of the south corner secs. 33 and 34, is north corner secs. 3 and 4; center of north-south road at east-west fence is also Johnson-Williamson county line	37 36 04.3	88 45 45.6	5,831
T. 10 S., R. 4 E., 12 feet north and 20 feet west of corner secs. 27, 28, 33, and 34, at northwest corner of crossroads; iron bench mark post stamped "Prim. Trav. Sta. No. 10, 1911, Illinois."	37 36 57.3	88 45 45.8	5,365

Magnetic declination for east border of quadrangle, 4° 15′ E.

MARION QUADRANGLE—Continued.

Along highways near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 12 S., R. 2 E.; center of east-west road at fence on line between secs. 3 and 4	37 30 03.7	88 59 01.5	.....
T. 12 S., R. 2 E.; road forks at road south on line between secs. 2 and 3; 130 feet north of road forks is north corner of secs. 2 and 3, T. 12 S., R. 2 E., and 20 feet east of this corner is south corner of secs. 34 and 35, T. 11 S., R. 2 E.	37 30 37.7	88 57 54.9	6,376
Chicago & Eastern Illinois R. R. crossing, 260 feet northeast of store building now used for storage purposes	37 31 04.4	88 57 21.6	3,806
T. 11 S., R. 2 E.; center of road at line between secs. 35 and 36, T lane north	37 31 16.5	88 56 48.3	2,949
T road southeast, 450 feet southwest of O. A. Lenon's mail box No. 20 in front of house	37 31 45.2	88 55 30.0	6,947
T. 11 S., R. 3 E.; center of road at fence on line between secs. 30 and 31	37 31 37.6	88 55 15.2	1,415
T. 11 S., R. 3 E., at the northeast corner of crossroads in the southwest part of the NW. ¼ sec. 32, 60 feet northeast of mail boxes 14, 15, and 16, on the Vienna-Goreville road, old one-story frame house stands at the southeast corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 14, 1915, Ill."	37 31 17.8	88 54 33.3	3,927
T. 11 S., R. 3 E., T road north; road west is second class, line between secs. 28 and 33	37 31 37.1	88 53 16.6	6,485
Right-angle bend in road just north of mail box 56; road west is on line between secs. 27 and 34	37 31 37.4	88 52 26.1	4,065
Road at creek just east of R. Riley's mail box	37 31 26.2	88 52 12.7	1,568
T. 11 S., R. 3 E.; center of east-west road at T lane north on line between secs. 34 and 35	37 31 25.7	88 51 19.6	4,277
Tunnel Hill; railroad crossing just south of depot	37 31 28.3	88 50 17.0	5,052
T. 11 S., R. 3 E., quarter corner between secs. 35 and 36; center of east-west road, just north of paling gate and 370 feet east of T road east, which is above and just southwest of north entrance of tunnel	37 31 12.8	88 50 13.6	1,587
T road south	37 31 13.4	88 49 57.4	1,310
T. 11 S., Rs. 3 and 4 E., quarter corner between secs. 31 and 36; T lane north	37 31 14.0	88 49 08.3	3,950
T road north	37 31 14.3	88 48 35.2	2,671
T. 11 S., R. 4 E.; T road south on line between secs. 32 and 33	37 31 00.8	88 46 54.6	8,220
Prim Trav. Sta. No. 4, 1913, Ill.	37 30 58.8	88 46 30.7	1,936

Magnetic declination for south border of quadrangle, 4½° E.

MOUND CITY QUADRANGLE.

Near northeast corner of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 14 S., R. 2 E., south corner of secs. 32 and 33; T road west	37 14 41.0	89 00 15.8	.....

PADUCAH QUADRANGLE.

Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Tps. 14 and 15 S., Rs. 5 and 6 E., stone corner secs. 1, 6, 31, and 36, on west edge of traveled part of north and south road, 10 feet east of center of triangle at public T road west; also corner between Pope and Massac counties	37 14 55.5	88 36 05.9	.....
Tps. 14 and 15 S., R. 5 E., stone corner secs. 1, 2, 35, and 36; public T roads, on south edge of east-west road	37 14 56.8	88 37 12.4	5,374
Tps. 14 and 15 S., R. 5 E., 750 feet south and 1,500 feet east of corner secs. 2, 3, 34, and 35, 15 feet south and 25 feet east of intersection of crossroads; iron bench mark post stamped "Prim. Trav. Sta. No. 7, 1913, Illinois"	37 14 50.2	88 37 59.6	3,878
Three corners, second-class T road northwest, center of northeast-southwest road at intersection, 5 feet northwest to center of triangle, 5 feet south to George Meyer's mail box	37 14 52.6	88 39 01.9	5,044

PADUCAH QUADRANGLE—Continued.

Along highways near north border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Forks of public roads northeast and northwest, 10 feet east to center of triangle	37 14 30.8	88 39 37.0	3,593
Round Knob, 60 feet north and 35 feet west of intersection of cross streets at Dr. Dixon's residence and drug store; iron bench-mark post stamped "Prim. Trav. Sta. No. 8, 1913, Illinois"	37 14 54.6	88 44 11.5	.. ..

Magnetic declination for north border of quadrangle, 4° 23′ E.

STONEFORT QUADRANGLE.

Along public roads.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 11 S., R. 6 E., stone corner secs. 13, 14, 23, and 24; stone is in corner of cross fences 1,300 feet north of G. L. Hancock's residence.	37 33 24.2	88 30 16.7	.....
Oak store and post office, 0.25 mile south of; public T road west, 5 feet west to center of triangle, 30 feet north to oak tree	37 33 37.9	88 30 49.8	3,004
T. 11 S., R. 6 E., quarter corner between secs. 11 and 14, at 90° bend in road to west 0.5 mile north of Oak post office	37 34 16.7	88 30 49.0	3,930
T. 11 S., R. 6 E., corner secs. 2, 3, 10, and 11; public T road east	37 35 08.3	88 31 02.3	5,330
Tps. 10 and 11 S., R. 6 E., on east-west line between secs. 2 and 35; line between Pope and Saline counties center of Harrisburg road at	37 35 03.5	88 30 53.6	5,627
NOTE.—2,220 feet west of the above is T. 10 S., R. 6 E., stone (south) corner of secs. 34 and 35; 140 feet east of this corner is T. 11 S., R. 6 E. (north) corner secs. 2 and 3.			
Pope-Saline county line, 1.2 miles north of; second-class road south at bend of main road to north, 30 feet west to oak on bank, 30 feet south to center of triangle	37 37 08.6	88 31 02.9	6,638
T. 10 S., R. 6 E., east-west line between secs. 23 and 26; center of road at crossing	37 37 49.3	88 31 03.4	4,115
NOTE.—1,330 feet west of the above is T. 10 S., R. 6 E., corner secs. 22, 23, 26, and 27; near creek bank at corner post of wire fence.			
Bridge over McSparin Branch, 500 feet north of; public T road east to Rudement, center of triangle at	37 38 02.5	88 31 03.2	1,350
T. 10 S., R. 6 E., stone corner secs. 23, 24, 25, and 26, at four corners, 1,000 feet east of Spring Valley Church	37 37 49.4	88 30 13.2	4,236
Rudement, primary traverse station No. 8, 1911	37 38 15.7	88 29 22.9	4,850

Magnetic declination for southeast border of quadrangle, 4° 44′ E.

Along highways near south border of quadrangle.

Three corners, center of north and south road at public T road east, 25 feet southeast to post in corner of fence	37 30 25.0	88 32 30.2	.....
Three corners, public T road east, center of triangle at	37 30 26.7	88 33 36.0	5,300
Tps. 11 and 12 S., R. 6 E., stone corner secs. 4, 5, 32, and 33, 10 feet west of oak tree at 90° bend in road to north	37 30 46.7	88 33 38.7	2,032
Eddyville, cross streets at Hathaway's Hotel, 35 feet northeast to corner hotel porch, 10 feet south to plank bridge	37 30 07.5	88 35 11.5	.....
T. 12 S., Rs. 5 and 6 E., stone quarter corner between secs. 1 and 6, 750 feet west of ford of small stream, 150 feet east of second-class fork southwest, 10 feet south of wire fence and 15 feet east of a blazed walnut tree and on line of wire fence	37 30 20.0	88 35 58.0	.....
Tps. 11 and 12 S., Rs. 5 and 6 E., 0.25 mile west of corner secs. 1, 6, 31, and 36, three corners, public T road west	37 30 45.8	88 36 14.4	2,936
Tps. 11 and 12 S., Rs. 5 and 6 E., stone corner secs. 1, 6, 31, and 36, at fence corner 0.25 mile east of three corners on township line between Tps. 11 and 12 S	37 30 45.8	88 35 57.7	1,342
Tps. 11 and 12 S., R. 5 E., 0.25 mile north and 0.25 mile east of corner secs. 1, 2, 35, and 36, in fence corner on south edge of east and west road in line with public T road north; iron bench-mark post stamped "Prim. Trav. Sta. No. 3, 1913, Ill."	37 30 58.8	88 36 47.2	4,202
Tps. 11 and 12 S., R. 5 E., stone at south corner secs. 35 and 36; 300 feet east of above is stone north corner secs. 1 and 2	37 30 45.9	88 37 03.9	1,872
Simon Miller's mail box, at bend of main road southwest and second-class road west	37 30 43.6	88 38 02.5	4,729

Magnetic declination for south border of quadrangle, 4° 37′ E.; for west border, °4 16′ E.

VIENNA QUADRANGLE.

Along highways near northeast corner of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Simpson, 0.5 mile northeast of; public T road east, 12 feet northeast to telephone pole	37 28 29.0	88 45 01.4	
Simpson station, 50 feet south of intersection of main track Illinois Central R. R. and public road crossing	37 28 04.3	88 45 16.3	2,776
T. 12 S., R. 4 E., corner secs. 9, 10, 15, and 16, at 90° bend in road to north	37 29 04.4	88 45 50.8	6,694
Simpson station, about 2 miles north of, 500 feet west of double bridges, 100 feet east of public T road south, intersection of Illinois Central R. R. and public road crossing	37 29 49.7	88 45 25.6	5,011

Along highways near east border of quadrangle.

T. 12 S., R. 4 E., quarter corner between secs. 15 and 22, 210 feet west of railroad crossing, 35 feet north of front door of shop; iron rod	37 28 05.1	88 45 18.7	
T. 12 S., R. 4 E., corner secs. 15, 16, 21, and 22; public T road south, 10 feet southeast to center of triangle	37 28 05.5	88 45 52.7	2,747
T. 12 S., R. 4 E., 740 feet west of quarter corner between secs. 16 and 21, on top of small hill, intersection of public crossroads	37 28 05.7	88 46 34.8	3,390
Simpson station, about 2 miles south of, at bottom of hill center of north and south road at second class T road through gateway, to west 25 feet northeast to hickory, 25 feet southwest to mail box	37 27 06.7	88 46 32.3	5,978
T. 12 S., R. 4 E., stone corner secs. 28, 29, 32, and 33, in orchard 25 feet north of center of public road at a point 25 feet east of gate to Mr. T. H. Sharpe's barn	37 26 20.5	88 46 58.1	5,113
Four corners, intersection of public crossroads, 30 feet northeast to corner post of wire fence, 40 feet northwest to two telephone poles	37 26 07.5	88 47 30.3	2,917
Three corners, public T road west, 10 feet west to center of triangle, 10 feet northeast to telephone pole	37 25 15.3	88 47 12.2	5,483
T. 13 S., R. 4 E., corner secs. 4, 5, 8, and 9, 1,370 feet east of T road north, in center of east and west road opposite rail fence north	37 24 31.8	88 46 56.1	4,595
Wartrace, 900 feet southeast of, in the NE. ¼ SW. ¼ sec. 9, T. 13 S., R. 4 E., on the north edge of road opposite public T road south to New Columbia; iron bench-mark post stamped "Prim. Trav. Sta. No. 5, 1913, Illinois"	37 23 57.8	88 46 42.9	3,604
T. 13 S., R. 4 E., stone corner secs. 9, 10, 15, and 16, in corner of east and west wire fence and T fence south, in woods 10 feet north of road	37 23 39.8	88 45 50.8	4,582
T. 13 S., R. 4 E., stone in center of sec. 34, 15 feet west of a gate about 300 feet southwest of John Comer's residence	37 20 36.6	88 45 20.6	
Tps. 13 and 14 S., R. 4 E., west line between secs. 3 and 34; also line between Massac and Johnson counties, center of public road	37 20 10.0	88 45 17.7	2,704
T. 14 S., R. 4 E., quarter corner between secs. 3 and 10; center of north and south road at second-class T road east, 0.25 mile south of schoolhouse	37 19 29.2	88 45 22.3	4,137
New Columbia, about 1 mile east of and 100 feet west of T road north; center of bridge over creek	37 18 50.3	88 45 22.3	3,938
T. 14 S., R. 4 E., stone quarter corner between secs. 10 and 15, in center of north and south road	37 18 36.7	88 45 22.1	1,373
Three corners, at foot of hill, 35 feet south of small stream, 20 feet west of center of triangle; center of north and south road at public T road east	37 18 22.7	88 45 38.8	1,959
Four corners, public T road east, second-class T road west, 80 feet south of plank bridge at south end of levee, 35 feet southeast of oak tree, 25 feet west of center of triangle	37 17 49.8	88 45 23.1	3,559
T. 14 S., R. 4 E., quarter corner between secs. 22 and 27, 60 feet west of road at first bridge at south end of levee	37 16 49.5	88 45 22.1	6,096
Three corners, near center of sec. 27, T. 14 N., R. 4 E., 150 feet north of Pleasant Union Schoolhouse; public T road west 10 feet northwest to oak	37 16 23.6	88 45 23.6	2,631

Along highways through center of quadrangle.

Prim. Trav. Sta. No. 5, 1913, Ill. (See above)	37 23 57.8	88 46 42.9	
Wartrace Schoolhouse, telephone pole in front of, 20 feet south of line between secs. 5 and 8, T. 13 S., R. 4 E	37 24 30.6	88 47 29.4	5,010
T lane north, 25 feet southwest of J. L. Hogg's mail box 47	37 24 43.6	88 48 04.0	3,086
T. 13 S., Rs. 3 and 4 E., center of east and west road in line with road south on town line between Rs. 3 and 4 E	37 24 40.0	88 49 09.3	5,282
T. 13 S., R. 4 E., west corner of secs. 6 and 7; center of north and south road at fence east	37 24 30.7	88 49 09.5	935
T. 13 S., R. 3 E., quarter corner between secs. 1 and 12; bend in road, 130 feet south of T road south	37 24 36.4	88 49 42.0	2,683

VIENNA QUADRANGLE—Continued.

Along highways through center of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 13 S., R. 3 E., center of east and west road at line between secs. 1 and 2, 200 feet south of schoolhouse and in line with fence north, 10 feet west of T lane north	37 24 39.2	88 50.14.9	2,669
T. 13 S., R. 3 E., T road south on line between secs. 2 and 3	37 24 48.1	88 51 21.1	5,418
T. 13 S., R. 3 E., T road south on line between secs. 3 and 4	37 25 03.6	88 52 27.3	5,570
Vienna, railroad crossing, main track, just south of depot	37 25 02.4	88 53 11.0	3,523
Vienna, in yard of Johnson County courthouse, 9 feet west of concrete base of gun near the northwest corner of courthouse; iron post stamped "Prim. Trav. Sta. No. 11, 1915, Ill."	37 24 55.6	88 53 47.0	2,980
T. 13 S., R. 3 E., line between secs. 5 and 6; bend in road at fence north, 240 feet west of small bridge	37 24 53.8	88 54 42.2	4,460
T. 13 S., R. 2 E., east corner of secs. 1 and 12; T road west (20 feet north of above corner is T. 13 S., R. 3 E., west corner of secs. 6 and 7, fence east)	37 24 37.6	88 55 41.7	5,072
T. 13 S., R. 2 E., corner of secs. 1, 2, 11, and 12; 20 feet north is T. 13 S., R. 3 E., center of east and west road at north and south fence line, 210 feet east of top of hill	37 24 28.6	88 56 47.5	5,382
T. 13 S., R. 2 E., line between secs. 2 and 11; T road south at Oak Grove schoolhouse, 2 feet east and 6 feet north of J. B. Stanley's mail box 30	37 24 27.4	88 57 04.0	1,339
T. 13 S., R. 2 E., quarter corner between secs. 10 and 11, 10 feet east of T lane south	37 23 58.2	88 57 54.9	5,056
Railroad crossing, Chicago, Burlington & Quincy R. R., east-west quarter-section line through sec. 10, T. 13 S., R. 2 E.	37 23 56.9	88 58 20.2	2,050
Cache River, east end of bridge over	37 23 44.1	88 58 32.1	1,609
T. 13 S., R. 2 E., line between secs. 15 and 16; T road west, 0.25 mile north of corner of secs. 15, 16, 21, and 22	37 22 49.0	88 59 01.8	6,070

Along highways near south border of quadrangle.

T. 14 S., R. 2 E., corner of secs. 27, 28, 33, and 34; center of east-west road at fence north, 200 feet east of large white house on north side of road	37 15 36.8	88 59 06.0	.....
T road south at Swan Lake Schoolhouse, 620 feet east of T road north	37 15 37.9	88 58 41.3	2,000
T. 14 S., R. 2 E., corner of secs. 26, 27, 34, and 35; T road north	37 15 39.8	88 57 57.1	3,580
West end of bridge over big ditch	37 15 41.6	88 57 08.5	3,930
T. 14 S., R. 2 E., corner of secs. 25, 26, 35, and 36; wooden post driven flush with ground in center of east and west road, in line with north and south fence	37 15 42.4	88 56 49.1	1,570
T. 14 S., R. 2 E., east corner of secs. 25 and 36, Pulaski-Massac county line (180 feet south of above corner is T. 14 S., R. 3 E. west corner of secs. 30 and 31; T road east)	37 15 44.9	88 55 41.4	5,484
Right-angle bend in road at lane east; township line	37 15 03.0	88 47 26.9	.....
T. 14 S., R. 4 E., center of sec. 32; T road east	37 15 30.4	88 47 36.0	2,858
T. 14 S., R. 4 E., quarter corner between secs. 32 and 33; center of east and west road at north and south fence line	37 15 30.2	88 47 02.9	2,670
T. 14 S., R. 4 E., quarter corner between secs. 33 and 34; T road south	37 15 30.3	88 45 56.0	5,410
Round Knob, 1 mile northwest of; T road west	37 15 30.0	88 44 59.6	4,560

Along highways, Chicago & Eastern Illinois R. R., and Cleveland, Cincinnati, Chicago & St. Louis R. R. near west border of quadrangle.

Buncombe, 1.5 miles northwest of; north end of bridge over Lick Creek	37 29 25.6	88 59 59.2	.....
Chicago & Eastern Illinois R. R., at second-class road crossing, 600 feet west of milepost "J 12"	37 18 04.7	88 59 12.0	.....
Karnak, junction of Chicago & Eastern Illinois and Big Four railroads	37 17 48.6	88 58 29.9	3,774
T. 14 S., R. 2 E., corner of secs. 15, 16, 21, and 22; corner fence post, 40 feet northeast of crossing	37 17 22.6	88 59 03.1	3,756

Magnetic declination through center of quadrangle, 4½° E.; for west border, 4¾° E. for north border, 4½° E.; for south border, 4¼° E.; for east border, 4° 23′ E.

ILLINOIS AND WISCONSIN.

PRIMARY TRAVERSE.

Belvidere, Oregon, Pecatonica, and Rockford quadrangles, Ill.; Brodhead quadrangle, Wis.

STEPHENSON AND WINNEBAGO COUNTIES, ILL.; GREEN AND ROCK COUNTIES, WIS.

The following geographic positions on North American datum were determined in 1915 by J. H. Wilson and are based on primary traverse positions determined in 1911, described in Bulletin 551:

BELVIDERE QUADRANGLE.

Along highways near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 46 N., R. 2 E., corner secs. 3, 4, 9, and 10, 650 feet south of cross-roads; center of north-south road	42 29 10.0	88 59 59.7	
T. 46 N., R. 2 E., corner secs. 9, 10, 15, and 16; crossroads	42 28 17.7	88 59 59.3	5,290
T. 46 N., R. 2 E., corner secs. 15, 16, 21, and 22; crossroads	42 27 25.4	88 59 59.0	5,300
T. 46 N., R. 2 E., corner secs. 21, 22, 27, and 28; T road north	42 26 33.1	88 59 58.8	5,290

Magnetic declination near west border, 2° 41′ E.

OREGON QUADRANGLE.

Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 26 N., R. 9 E., corner of secs. 16, 17, 20, and 21, 30 feet west and 30 feet north of, at northwest corner of crossroads, 0.8 mile south of Evarts, at district No. 5 schoolhouse; iron post stamped "Prim. Trav. Sta. No. 33, Ill., 1911"	42 14 39.60	89 28 26.80	
T. 26 N., R. 9 E., corner of secs. 15, 16, 21, and 22; crossroads	42 14 40.5	89 27 17.4	5,218
T. 26 N., R. 9 E., corner of secs. 14, 15, 22, and 23; center of east-west road	42 14 42.0	89 26 07.8	5,240
T. 26 N., R. 9 E., quarter corner between secs. 14 and 23; crossroads	42 14 42.6	89 25 32.8	2,630
T. 26 N., R. 9 E., corner of secs. 13, 14, 23, and 24; center of east-west road	42 14 43.3	89 24 58.2	2,605
T. 26 N., Rs. 9 and 10 E., corner of secs. 13, 24, 18, and 19; crossroads on Stephenson-Winnebago county line	42 14 43.8	89 23 47.8	5,300
T. 26 N., R. 10 E., corner of secs. 17, 18, 19, and 20; crossroads	42 14 44.7	89 22 38.1	5,240
T. 26 N., R. 10 E., corner of secs. 16, 17, 20, and 21; crossroads at Seward town hall	42 14 45.5	89 21 28.4	5,241
T. 26 N., R. 10 E., corner of secs. 15, 16, 21, and 22; T road south	42 14 46.2	89 20 18.4	5,270
T. 26 N., R. 10 E., corner of secs. 14, 15, 22, and 23; crossroads 20 feet north of concrete bridge	42 14 46.7	89 19 08.2	5,280
T. 26 N., R. 10 E., 25 feet south and 30 feet west of corner of secs. 13, 14, 23, and 24, at southwest corner of crossroads, 2 feet west of Wilke Braver's mail box; iron post stamped "Prim. Trav. Sta. No. 1, 1915"	42 14 47.4	89 17 59.0	5,205

Magnetic declination near north border of quadrangle, 4° 19′ E.

PECATONICA QUADRANGLE.

Along highways near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 28 N., R. 10 E., corner secs. 25, 26, 35, and 36; crossroads at schoolhouse	42 23 25.6	89 18 04.8	.....
T. 28 N., R. 10 E., corner secs. 23, 24, 25, and 26; crossroads	42 24 17.7	89 18 05.9	5,279
T. 28 N., Rs. 10 and 11 E., corner secs. 24, 25, 19, and 30; crossroads	42 24 20.1	89 16 56.6	5,207
T. 28 N., Rs. 10 and 11 E., corner secs. 13, 24, 18, and 19; crossroads	42 25 10.3	89 16 58.3	5,085
T. 28 N., R. 10 E., east corner secs. 12 and 13; T road west (235 feet north of above corner is west corner of secs. 7 and 18, T. 28 N., R. 11 E., T road east	42 26 02.2	89 16 59.8	5,250
Chicago, Milwaukee & St. Paul Ry.; center of north-south road crossing	42 26 20.2	89 17 00.4	1,820
T. 28 N., R. 10 E., quarter corner east side sec. 1, T road west (215 feet north of above corner is quarter corner west side sec. 6, T 28 N., R. 11 E., T road east at church)	42 27 20.0	89 17 02.2	6,066
Tps. 28 and 29 N., Rs. 10 and 11 E.; crossroads	42 27 45.8	89 17 02.9	2,610
T. 29 N., R. 10 E., quarter corner east side sec. 25; right-angle turn in road	42 29 03.9	89 17 04.9	7,910
Center of north-south road at crossing of east-west section line	42 29 29.6	89 17 22.8	2,926
T. 29 N., R. 10 E., about 0.25 mile west of north corner of fractional secs. 19 and 24, 30 feet south and 42 feet west of center of road forks, 30 feet south of Illinois-Wisconsin State line; iron post stamped "Prim. Trav. Sta. No. 4, 1915, Ill."	42 29 56.7	89 17 23.3	2,740
T. 29 N., R. 10 E., north corner fractional secs. 23 and 24, 160 feet east of center of road forks at road northeast; center of east-west road	42 29 57.7	89 18 15.7	3,928
T. 1 N., R. 10 E., south corner secs. 33 and 34; center of road on State line	42 29 57.8	89 18 24.8	680
T. 29 N., R. 10 E., north corner fractional secs. 22 and 23; T road south on Illinois-Wisconsin State line	42 29 58.9	89 19 26.6	4,631
T. 1 N., R. 10 E., south corner secs. 32 and 33; center of State line road	42 29 59.1	89 19 35.6	680
T. 29 N., R. 11 E., quarter corner between secs. 31 and 32, center of east-west road	42 28 13.2	89 15 52.9	.....
Sugar River, west end of bridge over	42 28 31.1	89 15 01.1	4,290
T. 26 N., R. 10 E., corner of secs. 11, 12, 13, and 14; crossroads at schoolhouse	42 15 39.9	89 17 59.5	.....
T. 26 N., R. 10 E., corner of secs. 1, 2, 11, and 12; crossroads	42 16 32.2	89 18 00.1	5,290
Chicago & North Western Ry. track at north-south road crossing, 80 feet north to Rockford & Interurban Electric Ry. crossing	42 17 13.5	89 18 00.7	4,180
T. 26 N., R. 10 E., north corner of secs. 1 and 2 (60 feet west of above corner is south corner of secs. 35 and 36, T. 27 N., R. 10 E.)	42 17 23.0	89 18 01.0	970
T. 27 N., R. 10 E., approximate quarter corner between secs. 35 and 36; crossroads	42 17 48.9	89 18 02.0	2,623
T. 27 N., R. 10 E., corner of secs. 25, 26, 35, and 36; T road east	42 18 15.3	89 18 02.2	2,665
T. 27 N., R. 10 E., corner of secs. 23, 24, 25, and 26; T road south	42 19 07.6	89 18 02.6	5,295
Center of north-south road at east-west section line	42 19 59.8	89 17 45.2	5,439
Watson Schoolhouse, T road south at	42 20 25.8	89 17 45.3	2,640
North-south line of township, at south end of jog in road, in line with road west	42 20 38.1	89 16 52.6	4,149
T. 27 N., R. 11 E., corner of secs. 7, 8, 17, and 18, right-angle turn in road	42 20 53.0	89 15 45.0	5,295
T. 27 N., R. 11 E., quarter corner between secs. 8 and 17; crossroads	42 20 53.4	89 15 10.0	2,634

Magnetic declination near east border of quadrangle, 4° 00′ E.

Along highways near north border of south half of quadrangle.

North-south section line center of road	42 22 00.4	89 15 44.9	.....
Pecatonica River, north end of Trask Bridge over, 25 feet north to large elm tree at north end of railing	42 22 20.6	89 15 53.4	2,143
Trask Bridge, about 0.5 mile northwest of; T road north	42 22 35.4	89 16 19.3	2,456
Mail box No. 31 (Haughton's)	42 22 35.2	89 17 12.7	4,005
T. 27 N., R. 10 E., 20 feet east of center of road north, on line between secs. 35 and 36, at northeast corner of road forks; iron post stamped "Prim. Trav. Sta. No. 2, 1915"	42 22 43.5	89 18 03.7	3, 17
Tps. 27 and 28 N., R. 10 E., about 500 feet south of apparent corner of secs. 2, 3, 34, and 35; center of north-south road at crossroads	42 22 39.5	89 19 08.5	4,881
T. 28 N., R. 10 E., quarter corner on south side of sec. 34; T road north	42 22 32.3	89 19 47.8	3,045
T. 27 N., R. 10 E., north corner of secs. 3 and 4; T road south (55 feet west of above corner is south corner of secs. 33 and 34, T. 28 N., R. 10 E.)	42 22 32.2	89 20 22.4	2,590

PECATONICA QUADRANGLE—Continued.

Along highways near north border of south half of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Tps. 27 and 28 N., R. 10 E., corner of secs. 4, 5, 32, and 33; stone at crossroads	42 22 32.1	89 21 33.1	5,309
T. 27 N., R. 10 E., 35 feet south and 45 feet east of north corner of secs. 5 and 6, and 35 feet south and 20 feet east of south corner of secs. 31 and 32, T. 28 N., R. 10 E., at southeast corner of crossroads just north of Blake schoolhouse; iron post stamped "Prim. Trav. Sta. No. 3, 1915"	42 22 31.6	89 22 42.7	5,223
Tps. 27 and 28 N., Rs. 9 and 10 E., crossroads at corner of Stephenson-Winnebago county line	42 22 31.4	89 23 52.0	5,202
T. 27 N., R. 9 E., north corner of secs. 35 and 36; center of east-west road	42 22 31.4	89 25 02.6	5,299
T. 28 N., R. 9 E., quarter corner south side of sec. 35; crossroads at schoolhouse (25 feet west of above corner is quarter corner north side of sec. 2, T. 27 N., R. 9 E.)	42 22 31.4	89 25 37.2	2,600
T. 28 N., R. 9 E., south corner of secs. 33 and 34; T road north (135 feet west of above corner is north corner of secs. 3 and 4, T. 27 N., R. 9 E.)	42 22 30.3	89 27 22.0	7,861
T. 27 N., R. 9 E., north corner of secs. 4 and 5, 25 feet east and 30 feet south of, at southeast corner of T road south, 100 feet west of T road north; iron post stamped "Prim. Trav. Sta. No. 30, Ill., 1911"	42 22 29.40	89 28 33.30	5,356

Along highways south through center of south half of quadrangle.

T. 27 N., R. 9 E., southeast corner of sec. 1; T road west	42 21 39.6	89 23 51.6	.....
T. 27 N., R. 10 E., southwest corner of sec. 7; T road east	42 20 50.2	89 23 51.2	5,000
T. 27 N., R. 9 E., east corner of secs. 12 and 13; T road west at schoolhouse	42 20 48.0	89 23 51.3	225
T. 27 N., R. 10 E., quarter corner west side of sec. 18; T road east	42 20 23.7	89 23 51.1	2,460
T. 27 N., R. 10 E., quarter corner between secs. 17 and 18; T road west	42 20 24.2	89 22 43.1	5,110
Road forks; center of concrete culvert at	42 19 55.3	89 22 39.4	2,933
T road west, probably a quarter corner	42 19 32.7	89 21 32.5	5,525
Pecatonica; north end of concrete bridge over Pecatonica River	42 19 03.2	89 21 32.9	2,987
Pecatonica, just east of station; center of main track of Chicago & North Western Ry. at Main Street crossing	42 18 54.0	89 21 33.1	933
Pecatonica, 300 feet north of pumping station cross streets	42 18 35.1	89 21 32.8	1,910
Pecatonica, about 1 mile west of pumping station on north-south section line; T road south	42 18 30.5	89 22 42.2	5,236
T. 27 N., R. 10 E., corner of secs. 29, 30, 31, and 32; center of north-south road	42 18 13.6	89 22 41.9	1,720
Pecatonica, about 2.5 miles southwest of pumping station; crossroads	42 17 13.9	89 22 41.5	6,040
T. 26 N., R. 10 E., corner of secs. 5, 6, 7, and 8; T road west	42 16 29.6	89 22 40.3	4,491
T. 26 N., R. 10 E., west corner of secs. 6 and 7; T road east just south of schoolhouse (30 feet south of above corner is east corner of secs. 1 and 12; county line)	42 16 28.4	89 23 49.2	5,182
T. 26 N., Rs. 9 and 10 E., corner of secs. 12, 13, 7, and 18; crossroads	42 15 35.9	89 23 48.4	5,320

Magnetic declination near south border of quadrangle, 4° 19′ E.; near east border of south half, 4° 11′ E.; near north border of south half, 4° 29′ E.; through center of south half, 4° 18′ E.

ROCKFORD QUADRANGLE.

Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 29 N., R. 11 E., corner secs. 27, 28, 33, and 34; crossroads at Wilson schoolhouse, No. 19	42 28 42.1	89 13 32.3	.....
T. 29 N., R. 11 E., corner secs. 26, 27, 34, and 35; T road north	42 28 43.5	89 12 22.2	5,250
T. 29 N., R. 11 E., quarter corner between secs. 26 and 35; crossroads at district 16 schoolhouse	42 28 44.1	89 11 47.1	2,631
T. 29 N., R. 11 E., corner secs. 25, 26, 35, and 36; center east-west road	42 28 44.9	89 11 12.2	2,620
T. 11 N., R. 11 E., 20 feet north and 615 feet west of east corner secs. 25 and 36, 20 feet north and 50 feet east of T road south; iron post stamped "Prim. Trav. Sta. No. 6, 1915, Ill."	42 28 44.9	89 10 36.2	2,696

ROCKFORD QUADRANGLE—Continued.

Along highways near north border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 29 N., R. 11 E., east corner secs. 25 and 36; center of road at crossing of third principal meridian (no fence, indefinite)	42 28 44.7	89 10 28.0	614
T. 46 N., R. 1 E., quarter corner between secs. 7 and 8; T road north at schoolhouse	42 28 36.7	89 09 25.6	4,749
T. 46 N., R. 1 E., quarter corner between secs. 8 and 9, 400 feet east of bridge; T road south	42 28 37.3	89 08 15.6	5,241
T. 46 N., R. 1 E., quarter corner between secs. 9 and 10, 1,320 feet west of T road south; center of east-west road	42 28 37.9	89 07 05.2	5,280
T. 46 N., R. 1 E., quarter corner between secs. 10 and 11; crossroads at schoolhouse	42 28 38.3	89 05 55.5	5,225
T. 46 N., R. 1 E., corner secs. 2, 3, 10, and 11; center of north-south road	42 29 04.4	89 05 55.3	2,650
T. 46 N., R. 1 E., stone at quarter corner between secs. 2 and 3; T road east	42 29 30.6	89 05 55.2	2,646
T. 46 N., R. 1 E., quarter corner between secs. 1 and 2; T road south	42 29 31.2	89 04 45.1	5,255
T. 46 N., Rs. 1 and 2 E., north corner of fractional secs. 1 and 6, on Illinois-Wisconsin State line; T road south	42 29 47.3	89 03 34.3	5,549
Beloit, east edge of west abutment of Shirland Avenue bridge over Rock River	42 29 47.5	89 02 31.8	4,683
Beloit, intersection of Broad and Prospect streets; manhole	42 29 56.2	89 01 50.4	3,225
Beloit, 80 feet southeast of railway crossing; north end of Grand Avenue Bridge	42 29 54.5	89 01 16.0	2,579
T. 46 N., R. 2 E., 35 feet north of north corner of fractional secs. 3 and 4, on State line, on north side of east-west road, at T road south; iron post stamped "Prim. Trav. Sta. No. 7, 1915, Ill."	42 29 46.9	89 00 00.0	5,745
Roscoe, 200 feet southeast of station, 155 feet west of T road north; center of main track of Chicago & North Western R. R	42 25 40.6	89 00 11.7	.....
Roscoe, at southeast corner of Bridge and Main streets; iron post stamped "Prim. Trav. Sta. No. 8, 1915, Ill."	42 24 47.6	89 00 32.8	5,594
Roscoe, north end of bridge over Rock River	42 24 48.0	89 00 58.5	1,930

Along highways near south border of north half of quadrangle.

Roscoe siding, intersection of main track and east-west road	42 24 45.4	89 02 42.0	7,772
Tps. 45 and 46 N., Rs. 1 and 2 E.; crossroads at corner of	42 24 44.4	89 03 34.2	3,920
T. 45 N., R. 1 E., north corner secs. 1 and 2; T road south (30 feet west of above corner is south corner of secs. 35 and 36, T. 46 N., R. 1 E., to road north)	42 24 43.6	89 04 43.0	5,160
T. 45 N., R. 1 E., north corner secs. 2 and 3; T road south (360 feet west of above corner is south corner of secs. 34 and 35, T. 46 N., R. 1 E.; T road north)	42 24 43.0	89 05 50.6	5,069
T. 45 N., R. 1 E., north corner secs. 3 and 4 (375 feet west of above corner is south corner secs. 33 and 34, T. 46 N., R. 1 E.)	42 24 42.3	89 07 00.9	5,280
T. 45 N., R. 1 E., quarter corner between secs. 3 and 4; T road west	42 24 16.9	89 07 00.7	2,575
T. 45 N., R. 1 E., quarter corner between secs. 4 and 5, 1,800 feet west of road north; center of east-west road	42 24 16.3	89 08 12.4	5,380
T. 45 N., R. 1 E., quarter corner between secs. 5 and 6, 1,350 feet west of; T road south, center of east-west road	42 24 15.7	89 09 21.7	5,200
T. 45 N., R. 1 E., quarter corner west side sec. 6, on principal meridian; T road east	42 24 15.5	89 10 28.1	4,980

Along highways on or near third principal meridian.

Tps. 28 and 29 N., R. 11 E., east corner secs. 1 and 36	42 27 53.6	89 10 28.3	.....
T. 46 N., R. 1 E., corner secs. 18 and 19; stone	42 27 18.3	89 10 28.3	3,568
T. 46 N., R. 1 E., quarter corner west side sec. 19, 150 feet north of road forks, in line with fence on principal meridian; center of road	42 26 52.1	89 10 28.4	2,650
Shirland, 100 feet west of station, main street crossing Chicago, Milwaukee & St. Paul Ry	42 26 37.9	89 11 51.3	6,377
Sugar River, south end of bridge over, between Harrison and Shirland	42 26 08.9	89 11 51.0	2,935
Harrison, 260 feet east of road forks, east end of bridge over Pecatonica River	42 25 40.2	89 11 42.7	2,968
T. 46 N., R. 1 E., 175 feet north of road forks and 45 feet north of a stone is a stone at corner of secs. 19 and 30	42 25 33.7	89 10 28.5	5,605
Tps. 45 and 46 N., R. 1 E., east corner secs. 6 and 31; center of north-south road	42 24 41.1	89 10 28.1	5,319
T. 45 N., R. 1 E., west corner secs. 6 and 7; center north and south road	42 23 49.2	89 10 27.7	.....
T. 45 N., R. 1 E., west corner secs. 7 and 18; center north and south road	42 22 56.8	89 10 27.3	5,300

ROCKFORD QUADRANGLE—Continued.

Along highways on or near third principal meridian—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Tps. 27 and 28 N., R. 11 E., east corner secs. 1 and 36; T road west	42 22 41.3	89 10 27.0	1,570
T. 45 N., R. 1 E., west corner secs. 18 and 19; T road east	42 22 04.4	89 10 26.8	3,740
T. 27 N., R. 11 E., 15 feet south and 25 feet east of east corner fractional secs. 1 and 12, on east of north-south road, along third principal meridian; iron post stamped "Prim. Trav. Sta. No. 9, 1915, Ill."	42 21 50.7	89 10 26.2	1,384

Along highways near west border of quadrangle.

T. 27 N., R. 11 E., corner secs. 1, 2, 11, and 12; crossroads	42 21 50.6	89 11 05.4	2,940
T. 27 N., R. 11 E., corner secs. 2, 3, 10, and 11; T road south at cemetery	42 21 49.3	89 12 15.3	5,250
T. 27 N., R. 11 E., corner secs. 3, 4, 9, and 10; crossroads	42 21 47.7	89 13 24.4	5,191
T. 27 N., R. 11 E., corner secs. 4, 5, 8, and 9; roads northeast and southwest	42 21 46.4	89 14 34.6	5,272

Magnetic declination near north border of quadrangle, 3° 40′ E.; near south border of north half, 3° 25′ E.; near third principal meridian, 3° 23′ E.

On highway near middle of west border of quadrangle.

Road forks, 20 feet from concrete culvert	42 21 37.9	89 14 55.3	.....

BRODHEAD QUADRANGLE.

Along highways near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 29 N., R. 10 E., north corner secs. 21 and 22; T road south	42 30 00.2	89 20 36.8	.....
T. 1 N., R. 10 E., south corner secs. 31 and 32; T road north	42 30 00.4	89 20 45.7	665
T. 29 N., R. 10 E., north corner fractional secs. 20 and 21; State line	42 30 01.1	89 21 47.3	4,620
T. 1 N., Rs. 9 and 10 E., south corner secs. 31 and 36; State line road at corner of Green and Rock counties	42 30 01.2	89 21 56.4	680
T. 29 N., R. 10 E., near fractional secs. 19 and 20; T road south	42 30 02.0	89 22 57.8	4,599
T. 1 N., R. 9 E., south corner secs. 35 and 36; T road north	42 30 02.1	89 23 06.6	664
T. 29 N., Rs. 9 and 10 E., 20 feet south and 30 feet west of north corner of fractional secs. 19 and 24, at southwest corner of cross-roads; iron post stamped "Prim. Trav. Sta. No. 5, 1915, Ill."	42 30 02.8	89 24 04.7	4,351
T. 1 N., R. 9 E., south corner secs. 34 and 35; center of road on State line	42 30 03.1	89 24 17.3	949
T. 29 N., R. 9 E., north corner fractional secs. 23 and 24; T road south	42 30 03.8	89 25 14.6	4,290
T. 1 N., R. 9 E., south corner secs. 33 and 34; T road north	42 30 03.9	89 25 27.9	1,000
T. 1 N., R. 9 E., south corner secs. 32 and 33; T road north	42 30 04.8	89 26 38.1	5,260
T. 29 N., R. 9 E., quarter corner north side of fractional sec. 22; T road south	42 30 05.0	89 26 59.4	1,600
T. 1 N., R. 9 E., south corner secs. 31 and 32; stone at T road north	42 30 05.5	89 27 49.1	3,721
T. 29 N., R. 9 E., about 0.3 mile west of northeast corner sec. 20, on south of State line road, 25 feet south and 50 feet west of T road south; iron post stamped "Prim. Trav. Sta. No. 29, Ill., 1911"	42 30 06.3	89 29 03.9	5,607

Magnetic declination near south border of quadrangle, 3° 40′ E.

WISCONSIN.

PRIMARY TRAVERSE.

Cambria, Fisk, Fox Lake, Montello, Neshkoro, Oshkosh, Portage, Poysippi, Ripon, Spring Lake, and Waupun quadrangles.

FOND DU LAC, GREEN LAKE, MARQUETTE, WAUSHARA, AND WINNEBAGO COUNTIES.

The following geographic positions on North American datum were determined by E. L. McNair in 1914 and are based upon United States Lake Survey triangulation stations Springvale and Observatory Hill, and upon a primary traverse position at South Oshkosh determined in 1908, described in Bulletin 440.

CAMBRIA QUADRANGLE.

Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 15 N., R. 11 E., quarter corner on west side of sec. 31, at Green Lake and Marquette county line; fence corners 120 feet south of center of public road	43 44 16.7	89 14 43.0	.....
T. 15 N., R. 11 E., at approximate quarter corner between secs. 31 and 32, near schoolhouse and at angle in road	43 44 16.5	89 13 35.7	4,940
T. 15 N., R. 11 E., at quarter corner between secs. 32 and 33; T road forks east, west, and south, and fence line north	43 44 16.8	89 12 23.6	5,290
T. 15 N., R. 11 E., quarter corner between secs. 33 and 34; east and west road at north-south fence line	43 44 16.8	89 11 11.2	5,320
T. 15 N., R. 11 E., in E. ½ sec. 34; T road forks east, west, and south	43 44 16.7	89 10 16.6	4,010
T. 15 N., R. 11 E., at apparent quarter corner between secs. 34 and 35; fence corners south and west	43 44 16.6	89 09 58.4	1,333
T. 15 N., R. 11 E., 25 feet east of T road forks north, south, and west, at quarter corner between secs. 35 and 36, 2½ feet west of corner fence post in line with fence east; iron bench-mark post stamped "Prim. Trav. Sta. No. 19, Wis., 1914"	43 44 16.7	89 08 46.5	5,282
T. 15 N., R. 11 E., corner secs. 25, 26, 35, and 36, 370 feet north of T road forks north, south, and east, at private lane west, center of north-south road	43 44 43.1	89 08 46.9	2,670
T. 15 N., Rs. 11 and 12 E., secs. 30 and 36; T road forks east and west, on line between	43 44 34.5	89 07 35.2	5,335
T. 15 N., R. 12 E., on line between secs. 29 and 30; east-west road at north and south fence line	43 44 11.8	89 06 23.2	5,768
T. 15 N., R. 12 E., in southeast quarter of sec. 29; T road forks east, west, and south	43 44 15.4	89 05 28.7	4,019
T. 15 N., R. 12 E., on line between secs. 28 and 29, at lane north and fence line south, east, and west road	43 44 19.0	89 05 11.1	1,338
T. 15 N., R. 12 E., in east half of sec. 28; T road forks east, west, and north	43 44 28.8	89 04 15.9	4,171
T. 15 N., R. 12 E., 0.25 mile south of corner of secs. 27, 28, 21, and 22, on line between secs. 7 and 28, at fence lines north and south, east and west road	43 44 41.6	89 03 57.9	1,847
At road forks bearing S. 27° 30′ E. and S. 12° 30′ W., 65 feet north of signpost marked "To Markesan, Marquette, and Princeton" in triangle formed by road forks	43 44 54.9	89 03 18.3	3,206

Magnetic declination for north border of quadrangle, 4° 00′ E.

FISK QUADRANGLE.

Along highways near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 15 N., R. 15 E., near center of sec. 20; crossroads	43 45 23.8	88 44 05.1	.....
Springvale triangulation station, in W. ½ SE. ¼ sec. 17, T. 15 N., R. 15 E., about 2 miles north and 2 miles east of boundary, on a rocky wooded knoll about 900 feet west of north and south road. (A stone post with hole in top seems to be the center point. No reference stones found. They may be below surface of ground)	43 46 05.42	88 43 53.29	.....

FISK QUADRANGLE—Continued.

Along highways near west border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 15 N., R. 15 W., corner secs. 7, 8, 17, and 18, 175 feet south of east and west fence, and at center of north and south private road	43 46 41.9	88 44 41.9	5,134
T road corners north, south, and west, private road south to residence	43 47 40.4	88 44 25.1	6,048
Tps. 15 and 16 N., R. 15 E., about quarter mile east of corner of secs. 31, 32, 5, and 6; T road forks east, west, and south at	43 48 28.2	88 44 24.9	4,840
Tps. 15 and 16 N., R. 15 E., at corner secs. 31, 32, 5, and 6, center of east and west road, at north-south fence lines	43 48 28.1	88 44 42.1	1,260
T. 16 N., R. 15 E., apparent corner secs. 7, 8, 17, and 18; T road forks north, south, and east	43 51 56.9	88 44 42.9	.....
T. 16 N., R. 15 E., 30 feet south and 30 feet east of crossroads at corner of secs. 5, 6, 7, and 8, 10 feet south of fence corner, 8 feet south of telephone pole, 2½ feet from fence line, and opposite schoolhouse; iron bench-mark post stamped "Prim. Trav. Sta. No. 7, 1914"	43 52 49.0	88 44 41.9	5,280
T. 16 N., R. 15 E., at quarter corner between secs. 5 and 6; T road corners north, south, and east	43 53 15.5	88 44 41.2	2,679
Fond du Lac-Winnebago county line; center of road at crossing of	43 53 41.4	88 44 34.2	2,670
T. 17 N., R. 15 E., at apparent quarter corner between secs. 31 and 32, and about 330 feet south of Chicago, Milwaukee & St. Paul Ry. crossing; T road forks north, south, and west	43 54 07.3	88 44 34.2	2,628
Pickett, west of, crossing of public road and Chicago, Milwaukee & St. Paul Ry	43 54 31.7	88 44 05.7	3,239
Pickett station, 1,070 feet east of, crossing of public road and Chicago, Milwaukee & St. Paul Ry	43 54 47.8	88 43 46.4	2,156
T. 17 N., R. 15 E., in NE. ¼ sec. 29; T road forks, north, south, and west	43 55 12.8	88 43 46.3	2,535
T. 17 N., R. 15 E., at center of E. ½ sec. 20; T road forks north, south, and east, fence line west	43 55 51.6	88 43 46.2	3,925
T. 17 N., R. 15 E., at center of N. ½ sec. 20; T road forks east, west, and north	43 56 06.5	88 44 04.8	2,030
T. 17 N., R. 15 E., corner secs. 17, 18, 19, and 20, set at junction of fence lines north, south, and east; square stone with cross cut in top	43 56 17.8	88 44 40.7	2,864
T. 17 N., R. 15 E., corner secs. 7, 8, 17, and 18; square cut stone	43 57 10.3	88 44 40.8	5,314
T. 17 N., R. 15 E., quarter corner secs. 7 and 8; square cut stone	43 57 36.6	88 44 40.9	2,663
T. 17 N., R. 15 E., corner secs. 5, 6, 7, and 8; cut stone	43 58 02.9	88 44 41.0	2,659
T. 17 N., R. 15 E., at apparent north corner secs. 5 and 6; T road corners east, west, and south	43 58 56.4	88 44 41.3	5,416
Tps. 17 and 18 N., R. 15 E., at quarter corner between secs. 5 and 32; public crossroads	43 58 56.3	88 44 04.4	3,705

Along highways near north border of quadrangle.

T. 18 N., R. 15 E., 35 feet south and 28 feet east of quarter corner secs. 29 and 32, at crossroads opposite schoolhouse and 2 feet west of fence corner; iron bench-mark post stamped "Prim. Trav. Sta. No. 8, 1914, Wis."	43 59 48.6	88 44 04.2	5,299
T. 18 N., R. 15 E., at apparent corner secs. 32, 33, 28, and 29, at fence line south; center of east-west road	43 59 48.7	88 43 28.4	2,618
T. 18 N., R. 15 E., corner secs. 33, 34, 27, and 28, at schoolhouse; public crossroads	43 59 48.4	88 42 15.5	5,330
T. 18 N., R. 15 E., at apparent corner of secs. 34, 35, 26, and 27, at fence line south; center of east-west road	43 59 48.6	88 41 03.0	5,300
T. 18 N., R. 15 E., quarter corner between secs. 26 and 35; T road forks east, west, and north, at	43 59 48.6	88 40 26.8	2,650
T. 18 N., R. 15 E., corner secs. 25, 36, 25, and 26; T road corners east, west, and south, at	43 59 48.6	88 39 50.4	2,660
T. 18 N., R. 15 E., quarter corner secs. 25 and 36; T road forks east, west, and north, at	43 59 48.5	88 39 14.0	2,660
T. 18 N., Rs. 15 and 16 E., on range line and at corner secs. 25, 36, 30, and 31, at fence lines north and south; center of east and west road	43 59 48.5	88 38 37.1	2,700
T. 18 N., R. 16 E., corner secs. 29, 30, 31, and 32; public crossroads at	43 59 47.8	88 37 24.0	5,345
T. 18 N., R. 16 E., at corner secs. 28, 29, 32, and 33; T road forks east, west, and north	43 59 47.1	88 36 10.8	5,349
T. 18 N., R. 16 E., between secs. 28 and 33; crossing of Chicago, Milwaukee & St. Paul Ry. and public road	43 59 46.8	88 35 22.8	3,510
T. 18 N., R. 16 E., at corner secs. 27, 28, 33, and 34; public road crossing	43 59 46.6	88 34 57.5	1,850
T. 18 N., R. 15 E., at apparent corner secs. 29, 30, 31, and 32; T road corners east, west, and north, at	43 59 48.8	88 44 41.3	.....

Magnetic declination for north border of quadrangle, 3° 14′ E.; for west border, 2° 59′ E.

FOX LAKE QUADRANGLE.

Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 15 N., Rs. 13 and 14 E., at quarter corner secs. 25 and 30, county line between Green Lake and Fond du Lac counties; T road corners east, west, and north	43 44 33.2	88 53 06.3	.....
T. 15 N., R. 14 E., on section line between secs. 29 and 30, 60 feet east of Fairwater station, crossing of street and Chicago, Milwaukee & St. Paul Ry	43 44 37.2	88 51 55.4	5,225
T. 15 N., R. 14 E., at apparent corner secs. 29, 30, 31, and 32; T road corners north, south, and east	43 44 06.4	88 51 55.0	3,120
T. 15 N., R. 14 E., corner secs. 28, 29, 32, and 33, crossroads at	43 44 06.3	88 50 43.1	5,280
T. 15 N., R. 14 E., corner secs. 27, 28, 33, and 34, crossroads at	43 44 06.0	88 49 31.1	5,290
T. 15 N., R. 14 E., corner secs. 26, 27, 34, and 35, crossroads at	43 44 06.0	88 48 18.2	5,354
Brandon, at apparent corner to secs. 25, 26, 35, and 36, T. 15 N., R. 14 E., intersection of streets at; Congregational Church on northwest street croner	43 44 06.0	88 47 06.2	5,290
Brandon station, 190 feet north of, street crossing of Chicago, Milwaukee & St. Paul Ry	43 44 09.3	88 46 51.2	1,149
T. 15 N., quarter mile north of east corner of secs. 25 and 36, on range line between Rs. 14 and 15 E.; T road corners north, south, and west	43 44 18.6	88 45 53.8	4,315

Magnetic declination for north border of quadrangle, 3° 16′ E.

MONTELLO QUADRANGLE.

Along highways near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 17 N., R. 10 E., on line between secs. 25 and 36; T road corners north, south, and west	43 54 32.4	89 15 05.8	.....
Tps. 16 and 17 N., on line between fence and private road east; center of road	43 53 40.2	89 15 06.3	5,288
Germania, 1,000 feet east of; iron bridge over Mecan River	43 53 28.6	89 15 12.2	1,245
T. 16 N., R. 10 E., on apparent section line between secs. 12 and 13; road forks, road west	43 52 33.7	89 15 12.4	5,561
T. 16 N., R. 10 E., east half of sec. 13, 15 feet west of T road corners, north, south, and east, 9 feet north and 5 feet west of signpost reading "Germania 2 miles, Princeton 6 miles"; iron post stamped "Prim. Trav. Sta. No. 17, Wis., 1914."	43 52 07.5	89 15 06.0	2,694
T. 16 N., R. 10 E., in N. ½ sec. 24, at public roads crossing railroad, main crossing, north, south, east, and west, center of track at	43 51 29 3	89 15 32 4	4,331
T. 16 N., R. 10 E., section line between secs. 24 and 25, at fence line west center of north-south private road	43 50 49.4	89 15 05.0	4,511
T. 16 N., R. 10 E., about 690 feet north of line between secs. 25 and 36; T road forks east, west, and north	43 50 04.0	89 15 05.2	4,590
T. 15 N., R. 10 E., quarter corner between secs. 1 and 12; T road corners north, south, and east	43 48 11.6	89 15 20.5	.....
T. 15 N., R. 10 E., at middle of sec. 13; T road corners north, south, and west	43 46 52.8	89 15 18.4	7,974
T. 15 N., R. 10 E., quarter corner between secs. 13 and 14, at fence line north and second-class road south; center of east-west road.	43 46 53.0	89 15 54.4	2,640
T. 15 N., R. 10 E., line between secs. 14 and 15, at north and south fence line; center of east-west road	43 46 51.7	89 17 12.3	5,720
T road corners east, west, and south	43 46 51.7	89 17 30.4	1,330
T. 15 N., R. 10 E., about 670 feet south of corner of secs. 9, 10, 15, and 16, at crossing of line between secs. 15 and 16, as indicated by cross fences in field; center of road	43 47 12.4	89 18 24.2	4,472
Montello, 35 feet southwest to edge of curb at Montello State Bank, 60 feet southeasterly to curb at Smart Block, 10 feet north to curbing	43 47 31.7	89 19 37.9	5,745
Montello, public road bridge at center of lock on Fox River	43 47 10.7	89 19 32.5	2,163
T. 15 N., R. 10 E., apparent line between secs. 17 and 20; center of angling road at fence line east and private lane west	43 46 26.0	89 19 56.1	4,839
T. 15 N., R. 10 E., on quarter line in west half of sec. 20; road crossing	43 45 59.3	89 20 22.5	3,333
T. 15 N., R. 10 E., corner of secs. 19, 20, 29, and 30, 20 feet west of center of road track, at fence lines east and west, in line with center of road south	43 45 33.1	89 20 48.7	3,276
T. 15 N., R. 10 E., at approximate quarter corner between secs. 29 and 30, 27 feet west of corner fence post in line with fence east and 30 feet south of center of T road west	43 45 06.8	89 20 48.4	2,661

Magnetic declination along east border of quadrangle, 3° 47′ E.

NESHKORO QUADRANGLE.

Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 18 N., R. 12 E., apparent corner of secs. 27, 28, 33, and 34, 1,000 feet north of crossroads, near schoolhouse at fence line east and west; center of north-south road	43 59 51.4	89 03 59.0	.....
T. 18 N., R. 12 E., 750 feet north of south corner of secs. 31 and 36, 15 feet south and 15 feet east of T road corners north, south, and west, 1 foot from north-south fence line; iron post stamped "Prim. Trav. Sta. No. 15, Wis., 1914"	43 59 06.6	89 07 40.3	.....
T. 18 N., R. 11 E., line between secs. 35 and 36, at T road forks east, west, and north	43 59 18.2	89 08 54.8	5,573
T. 18 N., R. 11 E., line between secs. 34 and 35, at T road forks east, west, and north	43 59 24.7	89 10 06.2	5,262
T. 18 N., R. 11 E., line between secs. 33 and 34, at fence line south; center of east-west road	43 59 24.3	89 11 18.4	5,284
T road forks north, south, and west	43 59 11.1	89 13 07.1	8,054
Chicago & North Western Ry. road crossing	43 59 10.7	89 13 34.3	1,990
T. 18 N., R. 11 E., in SW. ¼ sec. 31, 1,950 feet north of Waushara-Marquette county line, 35 feet south and 20 feet west of center of public crossroads, 6 feet south and 2 feet east of corner fence post; iron post stamped "Prim. Trav. Sta. No. 16, Wis., 1914"	43 59 16.3	89 14 37.8	4,679
T. 17 N., R. 11 E., on line between secs. 6 and 7, fence lines east and west, 140 feet north of T road forks north, south, and east; center of north and south road	43 58 01.2	89 14 29.4	7,634

Along highways near west border of quadrangle.

T. 17 N., R. 11 E., in west half of sec. 7; public crossroads	43 57 35.0	89 14 36.6	2,698
T. 17 N., R. 11 E., at line between secs. 7 and 18; public crossroads	43 57 08.9	89 14 32.2	2,665
T. 17 N., R. 11 E., at approximate line between secs. 18 and 19, and near quarter corner; T road forks north, south, and west	43 56 19.0	89 14 13.2	5,237
T. 17 N., Rs. 10 and 11 E., apparent quarter corner between secs. 19 and 24, near right angle in road; fence north and south	43 55 50.9	89 14 48.1	3,829
T. 17 N., Rs. 10 and 11 E., apparent corner of secs. 19, 30, 24, and 25, at crossroads	43 55 24.4	89 14 47.8	2,680
T. 16 N., Rs. 10 and 11 E., apparent corner of secs. 25, 36, 30, and 31, east-west fence line in line with fence north from angle of public road	43 49 57.2	89 14 47.0	.....
T road forks southwest, west and northeast	43 49 41.8	89 14 10.0	3,134
T. 16 N., R. 11 E., in southwest quarter of sec. 31, at Lutheran Church; T road forks southwest, west, and northeast	43 49 15.6	89 14 20.8	2,766
T. 15 N., R. 11 E., at quarter corner between secs. 5 and 6; T road corners east, west, and south	43 48 38.7	89 13 41.5	4,716
T. 15 N., R. 11 E., at corner of secs. 5, 6, 7, and 8; crossroads	43 48 12.5	89 13 40.9	2,653
T. 15 N., Rs. 10 and 11 E., at apparent corner of secs. 6, 7, 1, and 12, second-class road turns north, open field on south; center of east-west road	43 48 11.8	89 14 44.7	4,681

Along highways through center of quadrangle.

Mecan River; center of iron truss bridge over	43 52 07.9	89 13 46.4	.....
T. 16 N., R. 11 E., approximate quarter corner between secs. 16 and 17; east and west road at private lane north	43 52 08.4	89 12 30.4	5,569
T. 16 N., R. 11 E., in west half of sec. 16; T road forks east, west, and north	43 52 05.6	89 12 10.9	1,463
T. 16 N., R. 11 E., near corner of secs. 15, 16, 21, and 22, at east-west section line; center of east and west road	43 51 42.3	89 11 27.4	3,966
T. 16 N., R. 11 E., in SW. ¼ sec. 22, 40 feet west of mail box at road forks, in line with roads east and southwest	43 51 19.6	89 10 52.1	3,461
T. 16 N., R. 11 E., 875 feet west of line between secs. 22 and 23; T road forks east, west, and north	43 51 18.0	89 10 16.3	2,633
T. 16 N., R. 11 E., approximate quarter corner between secs. 23, and 24, at fence line north and south; center of east-west road	43 51 16.8	89 08 51.9	6,180
T. 16 N., R. 11 E., 1,290 feet east of quarter corner between secs. 23 and 24, 45 feet west and 25 feet north of road crossing, in line with roads north, south, and west, 5 feet west of corner fence post, opposite northeast corner of cemetery; iron post stamped "Prim. Trav. Sta. No. 20, Wis., 1914"	43 51 17.0	89 08 34.4	1,290
Princeton station, about 200 feet west of; center of public road at crossing of Chicago & North Western Ry	43 51 07.8	89 07 35.6	4,407
T road forks east, west and northeast	43 51 27.7	89 06 57.8	3,429
T. 16 N., R. 12 E., at quarter corner between secs. 16 and 17; T road forks north, south, and west, and private lane east	43 51 28.6	89 05 14.1	7,600

NESHKORO QUADRANGLE—Continued.

Along highways through center of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 16 N., R. 12 E., 670 feet north of apparent corner of secs. 8, 9, 16, and 17; T road forks east, west, and south	43 52 01.5	89 05 13.9	3,329
T. 16 N., R. 12 E., line between secs. 9 and 10, at fence lines north and south; center of east-west road	43 52 01.8	89 04 01.8	5,289
T. 16 N., R. 12 E., S. ½ sec. 10; public road crossing	43 52 04.8	89 03 26.0	2,640
T. 16 N., R. 12 E., on line between secs. 10 and 11, at north and south fence lines; center of east-west road	43 52 07.7	89 02 49.9	2,661
T. 16 N., R. 12 E., at line between secs. 11 and 12; T road forks east, west, and north	43 52 13.4	89 01 37.0	5,368
T. 16 N., R. 12 E., apparent quarter corner east side of sec. 12; at T road forks north, south, and west	43 52 17.2	89 00 24.2	5,350
T. 16 N., Rs. 12 and 13 E., on range line, apparent quarter corner on west side of sec. 7; T road forks north, south, and east	43 52 24.0	89 00 23.8	690

Along highways near south border of quadrangle.

T. 15 N., R. 12 E., center of sec. 23, fences north and south, at cemetery; center of east-west road	43 45 21.9	89 02 11.4	.....
T. 15 N., R. 12 E., 30 feet south and 35 feet east of T road corners at corner of secs. 23, 24, 25, and 26, 6 feet east of signpost at fence corners; iron post stamped "Prim. Trav. Sta. No. 12, 1914, Wis."	43 45 22.1	89 01 34.9	2,681
T. 15 N., Rs. 12 and 13 E., quarter corner between secs. 19 and 24; T road corners east, west, and south	43 45 24.3	89 00 23.9	5,220

Along highways near east border of quadrangle.

T road forks north, south, and west	43 59 25.6	89 00 53.6	.....
Tps. 17 and 18 N., R. 12 E., near quarter corner between secs. 1 and 36, at Waushara-Green Lake county line; T road forks north, south, and east	43 59 00.0	89 00 58.3	2,617
T. 17 N., R. 12 E., in S. ½ sec. 1; T road corners east, west, and north	43 58 16.7	89 00 58.0	4,384
T. 17 N., Rs. 12 and 13 E., near corner of secs. 1, 6, 7, and 12, at crossing of range line; at center of road	43 58 09.6	89 00 21.8	2,750
T. 16 N., Rs. 12 and 13 E., on range line, apparent quarter corner on west side of sec. 7; T road forks north, south, and east	43 52 24.0	89 00 23.8	.....
Chicago & Northwestern Ry. and public road crossing	43 51 30.6	89 03 26.2	.....
T. 16 N., R. 12 E., apparent center of sec. 22; T road forks east, west, and north	43 50 36.9	89 03 26.1	5,440
T. 16 N., R. 12 E., center of sec. 21; T road forks east, west, and south	43 50 36.2	89 04 38.4	5,295
T. 16 N., R. 12 E., quarter corner between secs. 21 and 28; public road crossing	43 50 10.1	89 04 38.4	2,640
T. 16 N., R. 12 E., quarter corner between secs. 28 and 33, at fence lines east and west; center of north-south road	43 49 17.6	89 04 38.2	5,323
T. 16 N., R. 12 E., center of sec. 33; public road crossing	43 48 51.3	89 04 38.3	2,660
Tps. 15 and 16 N., R. 12 E., at quarter corner between secs. 4 and 33; T road forks north, south, and west	43 48 25.1	89 04 38.1	2,649
T. 15 N., R. 12 E., apparent quarter corner between secs. 4 and 9, at east and west fence line; center of north-south road	43 47 32.1	89 04 37.9	5,370
T. 15 N., R. 12 E., near center of sec. 9; T road corners east, west, and north	43 47 06.2	89 04 37.4	2,620
T. 15 N., R. 12 E., corner of secs. 9, 10, 15, and 16; T road forks east, west, and south	43 46 39.4	89 04 01.4	3,788
T. 15 N., R. 12 E., corner of secs. 15, 16, 21, and 22, at fence lines east and west; at center of north-south road	43 45 47.2	89 03 00.0	5,285
T. 15 N., R. 12 E., in NE. ¼ sec. 21; T road forks north, south, and west	43 45 34.1	89 03 59.7	1,331
T. 15 N., R. 12 E., quarter corner between secs. 21 and 22, in line with road north at fence line west and 30 feet south of road east	43 45 21.0	89 03 59.4	1,320

Magnetic declination along north border of quadrangle, 1° 45′ E. to 5° 46′ E. (range), 3° 36′ E. (mean); for south border, 4° E.; for east border, 3° 30′ E.; for west border, 3° 47′ E.; near center, 3° 50′ E.

OSHKOSH QUADRANGLE.

Along highways near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 18 N., R. 16 E., on line between secs. 26 and 27; center of public road at north and south road	44 00 16.2	88 33 44.4	.....
South Oshkosh, at crossing of Tenth Street and "Soo" Ry	44 00 34.1	88 33 02.3	3,572
Oshkosh, in T. 18 N., R. 16 E., at crossing of line between secs. 25 and 26, intersection of Oregon and Tenth streets	44 00 34.2	88 32 32.4	2,185
South Oshkosh, second track of Chicago & North Western Ry., east of station and opposite bay window (description and position also in Bull. 440, p. 611)	44 00 32.8	88 32 04.3	2,059

Magnetic declination near south border of quadrangle, 3° 14′ E.

PORTAGE QUADRANGLE.

Along highways near north border of northeast quarter of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 15 N., R. 10 E., at corner of secs. 29, 30, 31, and 32, 870 feet north of overhead crossing of Chicago & North Western Ry., at fence line east and west; center of north and south road	43 44 40.8	89 20 48.0	.....
Tps. 14 and 15 N., R. 10 E., quarter corner between secs. 31 and 32; north and south road at east and west fence line	43 44 14.6	89 20 47.2	2,650
Tps. 14 and 15 N., R. 10 E., approximate corner of secs. 31, 32, 5, and 6, at east and west fence line; center of north and south road	43 43 48.6	89 20 47.1	2,638
T. 14 N., R. 10 E., approximate quarter corner between secs. 5 and 6, in line with roads north and west	43 43 22.1	89 20 46.2	2,682
T. 14 N., R. 10 E., in SW. ¼ sec. 6; T road corners east, west, and south	43 43 06.5	89 20 27.5	2,095
Observatory Hill triangulation station of the Coast and Geodetic Survey, in sec. 8, T. 14 N., R. 10 E., 864 feet east and 1,044 feet south of west quarter corner; underground mark; drill hole in rock ledge, rough surface, 3 feet below surface of ground; no surface mark	43 42 19.62	89 20 32.96	4,764
Chicago & North Western Ry., 500 feet south and a little west of bridge over tracks; T road corners north, south, and east	43 42 46.8	89 18 45.1	.....
T. 14 N., R. 10 E., about 0.25 mile west of corner of secs. 3, 4, 9, and 10, 30 feet south of road east, 15 feet east of center of road running west of south, 8 feet south of corner fence post, 1.5 feet from fence, in line with road north; iron post stamped "Prim. Trav. Sta. No. 18, 1914, Wis."	43 42 56.2	89 18 38.7	1,058
T. 14 N., R. 10 E., quarter corner between secs. 3 and 4; T road forks north, south, and west	43 43 22.7	89 18 21.8	2,962
Tps. 14 and 15 N., R. 10 E., corner of secs. 3, 4, 33, and 34, at fence line west; center of north and south road	43 43 49.5	89 18 22.7	2,710
Grand River; old bridge across and center of stream	43 44 00.6	89 16 09.5	9,845
T. 15 N., R. 10 E., on line between secs. 35 and 36	43 44 00.7	89 15 55.0	1,063

Magnetic declination near north border of northeast quarter of quadrangle, 4° E.

RIPON QUADRANGLE.

Along highways near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 16 N., R. 15 E., at quarter corner between secs. 30 and 31; T road corners east, west, and north	43 49 20.6	88 45 18.1	.....
T. 16 N., R. 15 E., 120 feet south of apparent quarter corner between secs. 19 and 30; crossing of public road and Chicago & North Western Ry	43 50 11.7	88 45 18.2	5,180
T road corners north, south, and east	43 50 38.6	88 45 16.9	2,724
T road corners east, west, and south	43 51 04.9	88 45 16.2	2,663
Chicago, Milwaukee & St. Paul Ry. and public road crossing	43 59 48.9	88 45 32.4	.....
T. 18 N., Rs. 14 and 15 E., corner of secs. 25, 30, 31, and 36	43 59 49.0	88 45 51.8	1,420

RIPON QUADRANGLE—Continued.

Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 18 N., R. 14 E., apparent corner of secs. 25, 26, 35, and 36, at fence lines north and south; center of east and west public road	43 59 50.0	88 47 04.5	5,317
T. 18 N., R. 14 E., corner of secs. 34, 35, 26, and 27; public cross-roads	43 59 50.8	88 48 17.6	5,340
T. 18 N., R. 13 E., corner of secs. 26, 27, 34, and 35; T road forks east, west, and north	43 59 52.8	88 55 34.6	.....
T. 18 N., R 13. E., quarter corner between secs. 27 and 34; T road forks east, west, and north	43 59 52.8	88 56 11.4	2,690
T. 18 N., R. 13 E., corner of secs. 27, 28, 33, and 34; public cross-roads	43 59 52.9	88 56 47.5	2,645
T. 18 N., R. 13 E., quarter corner between secs. 28 and 33; T road forks north, south, and east	43 59 52.8	88 57 23.8	2,650

Along highways near west border of quadrangle.

T. 17 N., R. 13 E., in S. ½ sec. 6; T road corners east, west, and north	43 58.11.1	88 59 48.5	.....
T. 17 N., R. 13 E., corner of secs. 5, 6, 7, and 8, in lane north and south, at fence west and about 200 feet south of center of public road	43 58 04.6	88 59 12.8	2,691
T. 17 N., R. 13 E., corner of secs. 7, 8, 17, and 18; stone	43 57 12.8	88 59 12.5	5,236
T. 17 N., R. 13 E., corner of secs. 17, 18, 19, and 20; public cross-roads	43 56 20.4	88 59 12.5	5,305
T. 17 N., R. 13 E., corner of secs. 16, 17, 20, and 21; public cross-roads	43 56 21.6	88 58 00.1	5,305
T. 17 N., R. 13 E., quarter corner between secs. 20 and 21; T road west	43 55 55.4	88 58 00.2	2,650
North and south road at fence line east	43 55 27.4	88 58 00.0	2,840
T. 17 N., R. 13 E., quarter corner between secs. 28 and 29; public crossroads	43 55 02.7	88 57 59.9	2,500
T. 17 N., R. 13 E., corner of secs. 28, 29, 32, and 33, at fence line east; center of north and south road	43 54 36.6	88 57 59.5	2,640
Tps. 16 and 17 N., R. 13 E., corner of secs. 31, 32, 5, and 6; road corners east and south	43 53 43.0	88 59 11.6	7,566
T. 16 N., R. 13 E., quarter corner between secs. 5 and 6; crossroads	43 53 16.5	88 59 11.3	2,690
T. 16 N., R. 13 E., 30 feet north and 25 feet west of T road corners at quarter corner between secs. 7 and 8, 2 feet northeast of corner fence post, signpost reads "Princeton 8 miles, Ripon 8 miles, Berlin 8 miles"; iron post stamped "Prim. Trav. Sta. No. 11, 1914, Wis."	43 52 24.6	88 59 11.8	5,257
T. 16 N., R. 13 E., center of sec. 8; T road south	43 52 24.0	88 58 34.7	2,723
T. 16 N., R. 13 E., quarter corner between secs. 8 and 9; center of east and west road at north and south fence line	43 52 23.8	88 57 58.4	2,655
T. 16 N., R. 13 E., center of sec. 9; T road forks east, west, and north	43 52 23.4	88 57 21.6	2,700
T. 16 N., R. 13 E., quarter corner between secs. 9 and 10, brick schoolhouse at corners; public crossroads	43 52 23.0	88 56 44.2	2,740
Public crossroads; center of	43 52 18.1	88 55 32.1	5,305
T. 16 N., R. 13 E., corner of secs. 10, 11, 14, and 15; center of north and south road at fence line east	43 51 56.5	88 55 32.2	2,185
Public crossroads	43 51 17.4	88 55 32.6	3,960
T. 16 N., R. 13 E., corner of secs. 14, 15, 22, and 23, at fence line east and west near schoolhouse; center of north and south road	43 51 04.4	88 55 32.8	1,321
T. 16 N., R. 13 E., quarter corner between secs. 22 and 23; T road forks east, west, and north	43 50 38.2	88 55 33.5	2,646
T road forks north, south, and west	43 50 38.3	88 54 38.8	4,010
Green Lake; small iron bridge over inlet of	43 50 23.9	88 54 30.6	1,578
T. 16 N., R. 13 E., approximate corner of secs. 23, 24, 25, and 26, 20 feet east to fence line north; T road corners northeast, southwest, and south	43 50 12.8	88 54 21.1	1,323
T. 16 N., R. 13 E., corner of secs. 25, 26, 35, and 36; T road corners north, south, and west	43 49 20.5	88 54 21.2	5,298
T. 16 N., R. 13 E., quarter corner between secs. 35 and 36; T road south	43 48 54.3	88 54 21.1.	2,650
T. 16 N., R. 13 E., corner of secs. 1, 2, 35, and 36; crossroads	43 48 28.1	88 54 20.4	2,650
T. 15 N., R. 13 E., north corner of secs. 2 and 3; T road corners east, west, and south	43 48 27.3	88 55 32.4	5,278
T. 15 N., R. 13 E., corner of secs. 2, 3, 10, and 11; crossroads	43 47 35.5	88 55 31.5	5,240
T. 15 N., R. 13 E., corner of secs. 10, 11, 14, and 15; center of north and south road	43 46 43.4	88 55 31.0	5,275
T. 15 N., R. 13 E., quarter corner between secs. 14 and 15; cross-roads	43 46 16.8	88 55 30.8	2,695

RIPON QUADRANGLE—Continued.

Along highways near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 15 N., R. 13 E., quarter corner between secs. 19 and 20; center of east and west road at north and south fence line	43 45 24.8	88 59 09.1	
T. 15 N., R. 13 E., quarter corner between secs. 20 and 21; center of east and west road at fence line north	43 45 25.1	88 57 55.4	5,410
T. 15 N., R. 13 E., center of sec. 21; crossroads	43 45 25.0	88 57 19.0	2,670
T. 15 N., R. 13 E., quarter corner between secs. 23 and 24; at crossroads	43 45 25.0	88 55 30.6	7,955
T. 15 N., R. 13 E., quarter corner between secs. 23 and 24; at crossroads	43 45 25.2	88 54 18.4	5,305
T. 15 N., Rs. 13 and 14 E., at quarter corner between secs. 19 and 24, 30 feet north and 35 feet west of center of public crossroads, 5 feet west of guide-post at fence corner, 2 feet from fence; iron post (not stamped) "Prim. Trav. Sta. No. 13, 1914, Wis."	43 45 25.8	88 53 06.8	5,252

Along highways through center of quadrangle.

T. 16 N., Rs. 14 and 15 E., 280 feet east of corner of secs. 1, 6, 12, and 7; T road forks east, northeast, and southwest	43 52 49.6	88 45 49.8	
T. 16 N., R. 14 E., on line between secs. 11 and 12; T road forks north, northeast, and southwest	43 52 10.5	88 47 07.3	6,920
T. 16 N., R. 14 E., on line between secs. 11 and 14; T road forks west, southwest, and northeast	43 51 58.1	88 47 31.8	2,186
Chicago, Milwaukee & St. Paul Ry. and public road crossing	43 51 58.2	88 48 07.8	2,645
T. 16 N., R. 14 E., 0.25 mile east of corner of secs. 9, 10, 15, and 16; public road crossing	43 51 58.4	88 49 14.9	4,915
Chicago, Milwaukee & St. Paul Ry. and public road crossing; 60 feet east of T road forks east, west, and north	43 51 58.4	88 49 50.4	2,600
Ripon, intersection of Eureka and Oshkosh streets, also quarter corner between secs. 16 and 21, T. 16 N., R. 14 E.	43 51 05.5	88 50 09.7	5,534
Ripon; crossing of Oshkosh Street and Chicago & North Western Ry. (This is very close to corner of secs. 16, 17, 20, and 21, T. 16 N., R. 14 E.)	43 51 05.1	88 50 45.0	2,588
T. 16 N., R. 14 E., in sec. 18; T road forks northwest and southeast	43 51 31.6	88 52 19.3	7,412
T. 16 N., Rs. 13 and 14 E., 25 feet south and 12 feet west of T road corners east, west, and north at quarter corner between secs. 13 and 18, 2 feet from fence and 4 feet from fences; iron post stamped "Prim. Trav. Sta. No. 14, 1914, Wis." (also county line between Fond du Lac and Green Lake counties)	43 51 31.6	88 53 07.0	3,490
T. 16 N., R. 13 E., in sec. 13; T road forks, east, west, and northwest	43 51 35.6	88 53 39.8	2,441
T. 16 N., R. 13 E., at section line between secs. 13 and 14; T road forks east, west, and south	43 51 30.3	88 54 19.6	2,967

Magnetic declination for north border of quadrangle, 3° 23′ E.; for south border, 3° 16′ E.; for east border, 2° 59′ E.; for west border, 3° 30′ E.; for center, 3° 36′ E.

POYSIPPI QUADRANGLE.

Along highways near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 18 N., R. 14 E., line between secs. 27 and 28, at fence line north and south; center of public road	44 00 00.8	88 49 29.7	
Eureka, crossroads at; Methodist Church on northeast corner	44 00 08.1	88 50 29.1	4,407
Eureka; drawbridge over Fox River	44 00 20.1	88 50 35.8	1,312
T. 18 N., R. 14 W., line between secs. 29 and 30; turn in public road south at private lane north	44 00 21.3	88 51 56.1	5,870
T. 18 N., Rs. 13 and 14 E., on line between, about 1,570 feet south of quarter corner between secs. 25 and 30, in line with road north on south side of road, 3 feet north of fence line, 4 feet northwest of oak tree at gateway to lane south; iron post stamped "Prim. Trav. Sta. No. 9, 1914, Wis."	44 00 02.6	88 53 09.8	5,710
T. 18 N., Rs. 13 and 14 E., quarter corner between secs. 25 and 30; T road forks north, south, and west	44 00 18.1	88 53 09.9	1,570
T. 18 N., R. 13 E., in W. ½ sec. 25; T road forks north, south, and east	44 00 18.4	88 54 04.6	4,005
T. 18 N., R. 13 E., on line between secs. 21 and 28; crossroads	44 00 44.7	88 57 34.1	
T. 18 N., R. 13 E., corner of secs. 20, 21, 28, and 29, at fence line north and south; center of east and west road	44 00 44.7	88 58 00.0	1,895

POYSIPPI QUADRANGLE—Continued.

Along highways near south border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 18 N., R. 13 E., at quarter corner between secs. 20 and 29; T road forks east, west, and south	44 00 44.4	88 58 35.7	2,605
T. 18 N., R. 13 E., corner of secs. 19, 20, 29, and 30; T road forks north, south, and east	44 00 44.2	88 59 11.7	2,630
T. 18 N., R. 13 E., quarter corner between secs. 29 and 30; T road forks north, south, and west	44 00 18.3	88 59 11.8	2,620

Magnetic declination for south border of quadrangle, 3° 23′ E.

SPRING LAKE QUADRANGLE.

Along highways near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 18 N., R. 12 E., near center of sec. 25, 25 feet east of center of road north, in line with road south and in line with lane west to house, 10 feet northeast of mail boxes; iron post stamped "Prim. Trav. Sta. No. 10, 1914, Wis."	44 00 11.3	89 00 57.4	.....
T. 18 N., R. 12 E., in N. ½ sec. 25; T road forks north, south, and west	44 00 30.6	89 00 59.0	.....
T. 18 N., R. 12 E., at quarter corner between secs. 22 and 23; T road forks north, south, and west	44 01 10.0	89 02 47.5	8,878
T. 18 N., R. 12 E., line between secs. 28 and 29, at north and south fence line; center of east and west road	44 00 07.3	89 05 12.1	.....
T. 18 N., R. 12 E., SW. ¼ sec. 29; T road forks northeast, southwest, and south	44 00 02.2	89 06 05.7	3,956
T. 18 N., R. 12 E., S. ½ sec. 30; public crossroads	44 00 04.0	89 07 00.0	3,968
T. 18 N., R. 12 E., SW. ¼ sec. 30; T road forks east, west, and south	44 00 09.2	89 07 29.5	2,223

Magnetic declination near south border of quadrangle, 3° 36′ E. (range from 1° 45′ E. to 5° 46′ E.).

WAUPUN QUADRANGLE.

Along highways near northwest corner of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 15 N., R. 15 E., quarter corner between secs. 29 and 30; east and west road at fence line north and south	43 44 31.3	88 44 40.8	.....
T. 15 N., R. 15 E., in center of sec. 29; T road corners east, west, and north	43 44 31.4	88 44 04.9	2,640
T. 15 N., R. 15 E., quarter corner between secs. 20 and 29, at fence line east and west; at north and south road	43 44 57.9	88 44 05.0	2,680

Magnetic declination near northwest corner of quadrangle, 3° 16′ E.

WISCONSIN AND MINNESOTA.

PRIMARY TRAVERSE.

Carlton, Superior, and Rockmont quadrangles.

DOUGLAS COUNTY, WIS.; ST. LOUIS COUNTY, MINN.

The following geographic positions on North American datum were determined by primary traverse and are based on Coast and Geodetic Survey triangulation stations Annie, Dedham, Superior, and Minnesota Point, south base. The work was done by E. L. McNair in 1914.

CARLTON QUADRANGLE.

Along highways near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
WISCONSIN.	° ′ ″	° ′ ″	*Feet.*
T. 47 N., R. 15 W., corner secs. 8, 9, 16, and 17; stake	46 33 40.4	92 15 56.8	.....
T. 47 N., R. 15 W., corner secs. 20, 21, 28, and 29, as located by south local surveyor	46 31 56.1	92 15 59.3	10,568
T. 47 N., R. 15 W., corner secs. 28, 29, 32, and 33; center north and south road	46 31 02.8	92 15 55.9	5,397
T. 47 N., R. 15 W., south corner secs. 32 and 33, 20 feet south and 5 feet east to T road forks, 2 feet northwest of post in east and west fence, and about 1 mile east of Foxboro; iron bench mark post stamped "Prim. Trav. Sta. No. 4, 1914, Wisconsin"	46 30 13.2	92 15 54.5	5,032
T. 46 N., R. 15 W., north corner secs. 4 and 5; T road south	46 30 13.3	92 15 30.6	1,685

Along highways and Duluth, Winnipeg & Pacific Ry.

MINNESOTA.			
Spirit Line Park station, about 300 feet northwest of; center of bridge over center of main track of Northern Pacific R. R.	46 40 44.3	92 15 37.6	.....
Duluth, Winnipeg & Pacific R. R.; public road crossing	46 41 08.2	92 15 42.2	2,450
Duluth, Winnipeg & Pacific R. R.; road crossing under trestle	46 41 32.3	92 16 19.9	3,585
Duluth, Winnipeg & Pacific R. R.; north and south road crossing	46 42 03.8	92 16 46.1	3,682
Annie triangulation station, in SW. ¼ SE. ¼ sec. 20, T. 49 N., R. 15 W., on highest point of a prominent wooded hill one-fourth mile south of Carlton and Duluth wagon road, 10 miles by road northeast of West Duluth; cross cut on rock; over this was set a piece of terra-cotta pipe 4 inches in diameter; pipe was filled with concrete and wire nail set in center of top marking station; reference mark, center of rude cross inscribed in circle about 5 inches in diameter, cut on surface of outcropping ledge, and distant 16.78 meters north of east from the station	46 42 28.60	92 15 55.55	4,324
T. 49 N., R. 15 W., quarter corner between secs. 20 and 21; forks of roads north, south, and west	46 42 48.4	92 15 31.7	2,606
T. 49 N., R. 15 W., apparent corner secs. 16, 17, 20, and 21	46 43 14.4	92 15 31.6	2,635

Magnetic declination near east border of quadrangle, 7° 30′ E.

SUPERIOR QUADRANGLE.

Along highways and railroad near center to east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
WISCONSIN.			
Superior triangulation station, in south side center of SE. ¼ sec. 11, T. 48 N., R. 14 W., about 1.8 miles southeast of South Superior and 20 paces north of wagon road along side of sec. 11; station and reference marks, usual type; the latter is 41.71 meters east from station, just inside fence along north side of road	° ′ ″ 46 38 52.84	° ′ ″ 92 05 06.22	*Feet.*
"Soo" Ry., 595 feet west of Great Northern R. R. crossing; overhead bridge	46 38 52.3	92 04 27.2	2,719
T. 48 N., R. 14 W., quarter corner secs. 12 and 13; T road forks, roads north and south, second-class road west	46 38 52.2	92 03 58.3	2,015
United States Steel Co.'s Belt Line R. R., north rail main track, at road crossing	46 38 23.1	92 03 58.7	2,950
United States Steel Co.'s Belt Line R. R., at intersection with range line between secs. 13 and 14; center of track	46 38 24.7	92 03 21.2	2,619
T. 48 N., R. 13 W., intersection United States Steel Co.'s Belt Line R. R. and line between secs. 17 and 18; center of track	46 38 30.3	92 02 09.8	5,010
United States Steel Co.'s Belt Line R. R., overhead crossing at road east and west	46 38 52.1	92 01 31.6	3,466
T. 48 N., R. 13 W., corner secs. 8, 9, 16, and 17; road crossing	46 38 52.2	92 00 55.2	2,535
Intersection of Northern Pacific Ry. and public road east and west known as "Lake Shore" road, in sec. 4	46 40 20.8	92 00 02.9	.....
Intersection Northern Pacific Ry. and highway	46 40 44.4	92 00 30.1	3,051
Crossing of Northern Pacific Ry. and track used by Great Northern Ry. leading to Itasca elevator	46 41 06.0	92 00 59.3	2,993
Allouez flag station, Northern Pacific Ry. street crossing at	46 41 24.6	92 01 23.1	2,510
Minnesota Point, south base, triangulation station; St. Louis County, Minn., situated on Minnesota Point near its southern extremity. Station mark, intersection of two cross lines cut in the surface of a brass frustrum leaded in end of a stone post 1 by 1 by 3 feet, 2 feet below surface. Observer, Lake Survey, 1870–71; Coast and Geodetic Survey, 1905. New station mark, a solid granite monument, 1 foot square at top, stands 15 inches above ground. No reference monuments visible. A well-made tower painted white erected over station. E. L. McNair, 1914	46 42 49.77	92 01 54.39	8,889

Along highways through center of quadrangle.

T. 48 N., R. 14 W., on line between secs. 13 and 24; T road forks, roads north, south, and west	46 38 00.1	92 04 01.6	.....
"Soo" Ry. crossing; center of track	46 38 00.0	92 04 05.9	295
T. 48 N., R. 14 W., at quarter corner secs. 14 and 23; roads east, west, and south (a good graveled road leads south and west)	46 38 00.1	92 05 15.5	4,861
T. 48 N., R. 14 W., on line between secs. 15 and 22; crossroads	46 38 00.3	92 06 15.6	4,190
T. 48 N., R. 14 W., 425 feet west of quarter corner of secs. 15 and 22, 25 feet north of center of road east and in line with road south to Boylston, 230 feet east of center of Great Northern Ry. tracks, 3 feet south of wire fence and about 1,500 feet south of Saunders station; iron bench mark post stamped "Prim. Trav. Sta. No. 2, 1914, Wis."	46 38 00.7	92 06 36.8	1,473
Saunders station, about 400 feet north of; center of west track of Great Northern R. R., at center of trestle over United States Steel Co.'s Belt Line R. R.	46 38 19.4	92 06 32.2	1,924
T. 48 N., R. 14 W., at apparent center of sec. 16; intersection of roads north and south	46 38 27.3	92 07 46.1	5,213
T. 48 N., R. 14 W., through middle of sec. 9; T roads forks, northeast, southwest, and south	46 39 02.1	92 07 45.3	3,530
Crossing of Northern Pacific R. R. and United States Steel Co.'s Belt Line R. R. about 500 feet southeast of	46 38 48.9	92 08 46.1	4,450
T. 48 N., R. 14 W., approximate at quarter corner between secs. 17 and 18; road forks (a cleared out but unused road to east)	46 38 28.6	92 09 38.9	4,214
T. 48 N., Rs. 14 and 15 W., on range line between secs. 19 and 24; center of road (an old cutting is visible north and south although much grown up; line is 60 feet east of telephone post No. 5895)	46 37 45.7	92 10 54.4	6,826
T. 48 N., R. 15 W., at crossroads, at telephone post No. 5868; north and south road is in middle of sec. 24	46 37 23.0	92 11 32.9	3,534
T. 48 N., R. 15 W., in southwest quarter of sec. 26, near angle in road, and opposite telephone pole No. 5822; center of road	46 36 35.5	92 12 55.9	7,527
T. 48 N., R. 15 W., about 750 feet south of corner secs. 27, 28, 33, and 34, 55 feet south and 20 feet west of T road with newly cleared road south, not graded or traveled; at edge of right-of-way cutting; iron bench mark post stamped "Prim. Trav. Sta. No. 3, 1914, Wis."	46 36 08.7	92 14 42.8	7,937

SUPERIOR QUADRANGLE—Continued.

Along highways near west border of southwest quarter of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Tps. 47 and 48 N., R. 15 W., corner secs. 3, 4, 33, and 34; iron pipe	46 35 23.8	92 14 42.1	4,550
T. 47 N., R. 15 W., corner secs. 3, 4, 9, and 10; north and south road	46 34 32.8	92 14 41.7	5,170

Along highways near south border of quadrangle.

T. 47 N., R. 15 W., south corner of secs. 34 and 35; T road north	46 30 14.0	92 13 25.2	.....
T. 47 N., R. 15 W., approximate south corner secs. 35 and 36, right angle in road; roads north and west	46 30 14.5	92 12 10.2	5,250
T. 47 N., R. 15 W., at right angle in road, corner secs. 23, 24, 25, and 26	46 31 57.5	92 12 10.5	10,440
T. 47 N., Rs. 14 and 15 W., corner secs. 19, 30, 24, and 25; fence line north and south	46 31 58.6	92 10 55.9	5,220
Forks at schoolhouse; roads east, west, and south	46 31 58.2	92 10 17.6	2,689
T. 47 N., R. 14 W., corner secs. 19, 20, 29, and 30; forks, roads east, west, and south	46 31 58.7	92 09 39.2	2,690
Dedham triangulation station in NW. ¼ sec. 29, T. 47, R. 14, about 900 feet south of Dedham and Black River Falls wagon road, 2.5 miles south of east from Dedham railway station on Great Northern Ry., and 2 miles southwest from Black River Falls on top of small rocky hill covered with small poplar brush. The point of 40-penny nail is subsurface stationmark. Piece of terra-cotta pipe was set over subsurface mark, and filled with concrete level with surface. A 60-penny wire nail in center of pipe marks center of surface station mark	46 31 49.93	92 09 27.46	1,213
T. 47 N., R. 14 W., quarter corner between secs. 20 and 29; stake	46 31 58.8	92 09 02.3	1,975
Manitou Falls, 415 feet northeast of concrete bridge over Black River, 40 feet west of center of north and south road on line between secs. 21 and 22, T. 47 N., R. 14 W.; iron bench-mark post stamped "Prim. Trav. Sta. No. 5, 1914, Wis."	46 32 11.7	92 07 10.1	7,949
T. 47 N., R. 14 W., corner secs. 22, 23, 26, and 27; road forks east, west, and south, fence line north	46 31 58.4	92 05 53.2	5,541
T. 47 N., R. 14 W., corner secs. 23, 24, 25, and 26; forks of roads east, west, and south (schoolhouse is at forks)	46 31 58.0	92 04 37.3	5,309
T. 47 N., R. 14 W., quarter corner secs. 24 and 25; center of public road crossing Borden Avenue north and south	46 31 57.7	92 03 59.2	2,665

Along highways on checked line.

T. 47 N., R. 14 W., center of sec. 25; T road west	46 31 31.2	92 03 59.5	2,690
T. 47 N., R. 14 W., quarter corner secs. 25 and 36; center of north and south road	46 31 05.1	92 03 59.8	2,640
T. 47 N., R. 14 W., quarter corner south side sec. 36, in line with road north and fence west	46 30 12.6	92 04 00.1	5,320

Main line continued.

T. 47 N., R. 13 W., apparent west corner of secs. 19 and 30; forks in road, east, west, and south; double fence line north	46 31 56.7	92 03 21.6	.....
T road corners; roads east, west, and north	46 31 56.5	92 02 45.8	2,505
T. 47 N., R. 13 W., corner secs. 19, 20, 29, and 30, east and west road at fence line south; clearing north	46 31 57.3	92 02 07.9	2,649
T. 47 N., R. 13 W., corner secs. 20, 21, 28, and 29; crossroads at signpost reading "Borden Ave. 2½ miles," "Rossiter Ave. 1½ miles," "South Range 6½ miles"	46 31 56.5	92 00 52.2	5,294

Along highways near west border of northwest quarter of quadrangle.

Carnegie station, about 0.25 mile west of; road crossing (this crossing is close to quarter corner secs. 13 and 24, T. 48 N., R. 15 W.)	46 38 01.2	92 11 32.4	.....
T. 48 N., Rs. 14 and 15 W., corner secs. 12, 13, 7, and 18	46 38 53.5	92 10 53.9	5,945
United States Steel Co. Ry.; public road crossing	46 39 27.1	92 11 00.4	3,429
MINNESOTA.			
St. Louis River, west end abutment of United States Steel Co.'s bridge over	46 39 30.6	92 12 51.8	.....
New Duluth, intersection of Commonwealth Avenue and Peary Street	46 39 35.8	92 13 34.3	3,015
New Duluth, 0.50 mile northwest of; T road north (road west to sand pit)	46 39 49.8	92 14 06.0	2,623

SUPERIOR QUADRANGLE—Continued.

Along highways on checked line.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Forks of roads northwest, east, and southwest; roads to Carlton and Cloquet branch here	46 43 26.0	92 14 47.9	.....
T. 49 N., R. 15 W., on north and south line between secs. 15 and 16; crossroads	46 43 21.3	92 14 16.1	2,267
T. 49 N., R. 15 W., corner secs. 9, 10, 15, and 16; center of north and south road	46 44 06.7	92 14 16.2	4,600
T. 49 N., R. 15 W., about 0.25 mile south of corner secs. 3, 4, 9, and 10, 30 feet north and 25 feet west of T road east and 20 feet north of lane west, 9 feet north of telephone pole; iron bench-mark post stamped "Prim. Trav. Sta. No. 1, 1914, Minnesota"	46 44 45.8	92 14 16.3	3,965
Proctor station, 100 feet north of; street crossing, center of double tracks	46 44 38.6	92 13 35.6	2,934
Proctor, water tower at (Proctor Knott tank connected with this point by topographer using plane-table stadia and solar chart)	46 44 51.2	92 12 42.6	3,903

Magnetic declination for east border of quadrangle, 8° E.; for west border, 7° 30′ E.; for south border, 8° 30′ E.; for center, 8° 15′ E.

ROCKMONT QUADRANGLE.

Along highways near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 47 N., R. 13 W., corner secs. 21, 22, 27, and 28; T road south	46 31 57.0	91 59 36.7	.....

Along highways on unchecked spur line.

T. 47 N., R. 13 W., quarter corner secs. 27 and 28; T road west	46 31 31.1	91 59 36.3	
T. 47 N., R. 13 W., approximate corner secs. 27, 28, 33, and 34, 20 feet south of T road west; crossing of logging railway and public road	46 31 05.0	91 59 36.2	2,630 2,640
T. 47 N., R. 13 W., south corner secs. 33 and 34, 20 feet south of T road north, in line with road north; iron bench-mark post stamped "Prim. Trav. Sta. No. 6, 1914, Wis."	46 30 12.7	91 59 35.7	5,299

Main line continued.

T. 47 N., R. 13 W., quarter corner secs. 22 and 27; roads north and west	46 31 56.9	91 58 58.9	.....
T. 47 N., R. 13 W., quarter corner secs. 15 and 22; crossroads	46 32 49.2	91 58 59.0	5,300
T. 47 N., R. 13 W., apparent quarter corner secs. 10 and 15; center of north and south road at east and west fence	46 33 41.2	91 59 01.2	5,264
T. 47 N., R. 13 W., apparent quarter corner secs. 3 and 10; center of north and south road	46 34 33.2	91 59 00.3	5,274
T. 47 N., R. 13 W., center of sec. 3, at Lundeen School; center of public crossroads	46 34 59.3	91 58 59.5	2,640
T. 48 N., R. 13 W., quarter corner secs. 27 and 34; T road west	46 36 15.5	91 59 00.6	7,720
T. 47 N., R. 13 W., apparent quarter corner between secs. 22 and 27; T road corners, roads north, south, and east	46 37 07.8	91 59 00.9	5,300
T. 48 N., R. 13 W., apparent quarter corner between secs. 15 and 22, at center of north and south road, 440 feet south of junction of Rossiter Avenue and Grand Avenue roads	46 38 00.1	91 59 01.4	5,295
T road forks, roads northeast, southwest, and north; center of	46 38 35.2	91 59 40.5	4,486

Along highways near west border of quadrangle.

Crossing of Chicago & North Western R. R.; also used by Duluth, South Shore & Atlantic Ry	46 38 52.2	91 59 57.4	.....
T. 48 N., R. 13 W., 125 feet west and 20 feet south of T road south at quarter corner secs. 10 and 15, 2 feet south of east and west fence and 1 foot east of fence north, 0.75 mile east of Chicago & North Western R. R. at Parkland; iron bench mark post stamped "Prim. Trav. Sta. No. 1, 1914, Wisconsin"	46 38 52.3	91 59 02.3	3,842
Northern Pacific R. R.; public road crossing	46 38 52.0	91 58 35.1	1,899
T. 48 N., R. 13 W., on section line between secs. 3 and 10, at public road crossing Northern Pacific R. R	46 39 43.9	91 59 30.8	6,535

Magnetic declination near west border of quadrangle, 8° E.

MINNESOTA.

PRIMARY TRAVERSE.

Anoka, Elk River, Lakenetta, Tarn, and Walbo quadrangles.

ANOKA AND ISANTI COUNTIES.

The following geographic positions on North American datum were determined by J. H. Wilson in 1915 and are based on Mississippi River Commission triangulation stations Carvel and Clark.

ANOKA QUADRANGLE.

Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Anoka, about 1 mile northwest of, in NW. ¼ SW. ¼ sec. 36, T. 32 N., R. 25 W., 400 meters north of Great Northern Ry., 500 meters west of north-south State road, 250 meters north of residence of B. Nye, and 8.1 meters east of southeast corner of small vacant house used as a granary on property of R. D. Carvel. Blazed trees, 24-inch double oak 190°, 10.8 meters; 10-inch double oak 137°, 8.4 meters; tile and pipe on high ground in cultivated field; Carvel triangulation station	45 13 05.40	93 24 08.42	.....
Anoka, center of Great Northern Ry. track in front of telegraph-office window of station	45 12 19.8	93 22 35.6	8,090
Tps. 31 and 32 N., R. 24 W., quarter corner between secs. 6 and 31; center of north-south road	45 12 45.0	93 22 39.8	2,561
T. 32 N., R. 24 W., quarter corner between secs. 30 and 31; center of north-south road	45 13 37.0	93 22 39.5	5,269
T. 32 N., R. 24 W., quarter corner between secs. 19 and 30; center of north-south road at fence line, lane east	45 14 28.6	93 22 38.4	5,231

Magnetic declination for north border of quadrangle, 8° 26′ E.

ELK RIVER QUADRANGLE.

Along highways near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Itasca, 1.5 miles north of railroad station, 0.5 mile east of Anoka-Sherburne county line, 1,000 meters northeast of George Clark's house, on quarter-section line of N. ½ sec. 18, T. 32 N., R. 25 W., 15 meters west and 4 meters south of fence corner at southeast corner of cultivated field, in edge of pasture, tile and pipe; Mississippi River Commission triangulation station Clark	45 16 04.43	93 30 04.39	.....
T. 32 N., R. 25 W., quarter corner between secs. 6 and 7; T road east	45 17 05.6	93 30 02.1	6,206
Tps. 32 and 33 N., R. 25 W., quarter corner between secs. 6 and 31, 660 feet south of T road east at schoolhouse; crossroads	45 17 57.9	93 30 00.9	5,296
T. 33 N., R. 25 W., quarter corner between secs. 30 and 31, north-south road at fence line	45 18 49.9	93 30 01.5	5,270
T. 33 N., R. 25 W., quarter corner between secs. 19 and 30, at German Lutheran Church; crossroads	45 19 42.0	93 30 02.0	5,278
T. 33 N., Rs. 25 and 26 W., corner secs. 18, 19, 13, and 24, 20 feet west of right-angle bend in road	45 20 33.3	93 30 36.4	5,746
T. 33 N., Rs. 25 and 26 W., corner secs. 7, 18, 12, and 13; center of county line road at fence west	45 21 25.8	93 30 35.8	5,312
T. 33 N., Rs. 25 and 26 W., corner secs. 6, 7, 1, and 12, 20 feet east of T road west	45 22 18.1	93 30 35.5	5,302

ELK RIVER QUADRANGLE—Continued.

Along highways near east border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 33 N., Rs. 25 and 26 W., 1,319 feet north of corner of secs. 6, 7, 1, and 12, 20 feet north of T road east, on Anoka-Sherburne county line; iron post stamped "Prim. Trav. Sta. No. 8, 1915, Minn."	45 22 31.2	93 30 35.3	1,319
Tps. 33 and 34 N., Rs. 25 and 26 W., 15 feet east to T fence east; probable corner	45 23 08.2	93 30 34.8	3,750
Fork in road, 690 feet north of road east; road south	45 24 18.8	93 30 37.5	7,148
T. 34 N., Rs. 25 and 26 W., corner secs. 18, 19, 13, and 24; T road east	45 25 44.5	93 30 36.1	8,692
T. 34 N., Rs. 25 and 26 W., stone at corner secs. 7, 18, 12, and 13, 12 feet east of center of crossroads	45 26 36.6	93 30 37.0	5,278
T. 34 N., R. 25 W., on line between secs. 6 and 7; center of road at fence	45 27 28.1	93 30 02.8	5,758

Magnetic declination for east border of quadrangle, 7° 36′ E.

LAKENETTA QUADRANGLE.

Along highways near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 32 N., R. 23 W., corner secs. 17, 18, 19, and 20; center of east-west road, at fence line	45 15 19.0	93 14 42.7	.....
T. 32 N., R. 23 W., 20 feet north and 20 feet east of quarter corner of secs. 17 and 20, on east side of Minneapolis-Duluth road; iron post stamped "Prim. Trav. Sta. No. 5, 1915, Minn."	45 15 19.6	93 14 04.8	2,715
T. 32 N., R. 23 W., 3,940 feet north of quarter corner secs. 17 and 20; crossroads	45 15 58.4	93 14 05.5	3,940
T. 32 N., R. 23 W., quarter corner secs. 5 and 8, 1,190 feet south of road forks at church, 150 feet south of road east to Coon Lake, center of north-south road at fence line	45 17 03.9	93 14 05.3	6,630
Tps. 32 and 33 N., R. 23 W., quarter corner secs. 5 and 32; T road west	45 17 53.2	93 14 03.0	4,990
T. 33 N., R. 23 W., approximate quarter corner secs. 29 and 32	45 18 45.0	93 14 08.7	5,269
T. 33 N., R. 23 W., center of sec. 29; crossroads	45 19 11.1	93 14 10.3	2,640
T. 33 N., R. 23 W., center of sec. 20, 640 feet south of road west; T road east	45 20 03.1	93 14 12.5	5,269
T. 33 N., R. 23 W., quarter corner between secs. 17 and 20; center of north-south road at road southwest	45 20 29.6	93 14 12.7	2,690
T. 33 N., R. 23 W., quarter corner between secs. 8 and 17; T road west	45 21 21.7	93 14 12.7	5,270
T. 33 N., R. 23 W., 20 feet south and 30 feet west of quarter corner between secs. 5 and 8, just inside of fence corner at southwest corner of crossroads at Methodist Church and district No. 40 schoolhouse; iron post stamped "Prim. Trav. Sta. No. 6, 1915, Minn."	45 22 14.0	93 14 12.6	5,300
T. 33 N., R. 23 W., on line between secs. 5 and 32; T road west	45 23 05.4	93 14 05.1	5,236
T. 34 N., R. 23 W., quarter corner between secs. 29 and 32, just north of district No. 3 schoolhouse; crossroads	45 23 57.3	93 14 04.7	5,258
T. 34 N., R. 23 W., quarter corner between secs. 20 and 29, on Isanti-Anoka County line; T road east	45 24 49.8	93 14 06.4	5,310
T. 34 N., R. 23 W., quarter corner between secs. 17 and 20; T lane east	45 25 41.8	93 14 07.2	5,270
T. 34 N., R. 23 W., quarter corner between secs. 8 and 17; cross-roads at schoolhouse	45 26 34.0	93 14 08.2	5,290
T. 34 N., R. 23 W., quarter corner between secs. 5 and 8; T road east	45 27 26.6	93 14 06.0	5,331
Tps. 34 and 35 N., R. 23 W., quarter corner between secs. 5 and 32; center of north-south road at fence line	45 28 16.6	93 14 04.9	5,060
T. 35 N., R. 23 W., line between secs. 29 and 32, 0.25 mile south and 0.25 mile east of Isanti	45 29 08.6	93 14 16.9	5,330
T. 35 N., R. 23 W., 30 feet south of east-west half section line in sec. 29, 0.70 mile east of public-school building at Isanti, and just south of district school at crossroads; iron post stamped "Prim. Trav. Sta. No. 11, 1915, Minn."	45 29 34.5	93 14 13.5	2,634

Magnetic declination for west border of quadrangle, 8° 37′ E.

TARN QUADRANGLE.

Along highways near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 32 N., R. 24 W., 15 feet west of quarter corner between secs. 18 and 19, on west side of north-south road in line with road east, 700 feet south of yellow brick schoolhouse; iron post stamped "Prim. Trav. Sta. No. 4, 1915, Minn."	45 15 20.7	93 22 38.0	.....
T. 32 N., R. 24 W., corner secs. 17, 18, 19, and 20, center of east-west road	45 15 20.8	93 22 01.0	2,650
T. 32 N., R. 24 W., corner secs. 16, 17, 20, and 21, 55 feet north and 70 feet east of northeast corner of town hall	45 15 20.0	93 20 47.5	5,259
T. 32 N., R. 24 W., quarter corner between secs. 16 and 17, 10 feet north of lane west; T road east	45 15 46.2	93 20 47.9	2,643
T. 32 N., R. 24 W., quarter corner between secs. 15 and 16, 890 feet east of road northeast, at fence south; center of east-west road	45 15 46.7	93 19 33.7	5,310
T. 32 N., R. 24 W., center of sec. 15, 45 feet west of Christenson's mail box; T road south	45 15 46.0	93 18 57.8	2,568
T. 32 N., R. 24 W., quarter corner secs. 14 and 15, 190 feet south of crossroads; center of north-south road	45 15 45.4	93 18 20.8	2,648
Constance, just north of milepost 129; railroad crossing	45 15 44.6	93 17 25.9	3,928
T. 32 N., R. 24 W., quarter corner between secs. 13 and 14; crossroads at Constance post office	45 15 44.3	93 17 07.6	1,310
T. 32 N., R. 24 W., corner secs. 13, 14, 23, and 24; crossroads	45 15 18.1	93 17 07.3	2,655
T. 32 N., Rs. 23 and 24 W., near corner secs. 13, 24, 18, and 19; T road south	45 15 22.0	93 15 54.4	5,226

Along highways through center of quadrangle.

T. 33 N., Rs. 23 and 24 W., corner secs. 1, 12, 6, and 7; crossroads	45 22 14.2	93 15 55.7	.....
Bethel, 2 miles south of; east-west roads, at railroad crossing	45 22 13.9	93 16 26.7	2,215
T. 33 N., R. 24 W., corner secs. 1, 2, 11, and 12; T road north	45 22 13.6	93 17 09.5	3,055
T. 33 N., R. 24 W., corner secs. 2, 3, 10, and 11; east-west road	45 22 13.3	93 18 24.0	5,320
T. 33 N., R. 24 W., corner secs. 3, 4, 9, and 10, 1,320 feet west of road north; center of east-west road	45 22 13.3	93 19 37.8	5,266
T. 33 N., R. 24 W., corner secs. 4, 5, 8, and 9; T road east	45 22 14.0	93 20 51.0	5,229
St. Francis, 330 feet west of west end of bridge over Rum River, in northwest corner of park, at southeast corner of T road south; iron post stamped "Prim. Trav. Sta. No. 7, 1915, Minn."	45 23 12.8	93 21 33.2	6,670
Seeley Brook, 760 feet southwest of bridge over, just east of east end of Norris Lake, 45 feet west of mail box on twin oak tree; center of triangle at road forks	45 22 45.7	93 23 01.2	6,856
Norris Lake, center of road along north side of, at fence north	45 22 49.0	93 23 17.9	1,244
O. E. Liens's and two other mail boxes at road forks	45 22 45.3	93 24 31.7	5,280
T. 33 N., R. 25 W., corner secs. 2, 3, 10, and 11, at district No. 49 schoolhouse; crossroads	45 22 16.2	93 25 45.6	6,047
Nordtrom's, Weslund's, and Anderson's mail boxes, at road east	45 22 16.0	93 26 46.5	4,347
T. 33 N., R. 25 W., 0.25 mile south of corner of secs. 3, 4, 9, and 10, 400 feet west of road forks, at fence line; center of east-west road	45 22 03.3	93 26 59.4	1,581
T road north	45 22 03.6	93 27 54.7	3,950
Road forks, center of, at road west	45 22 30.2	93 29 13.8	6,258

Along highways near west border of quadrangle.

Blue Lake, on banks of, 300 feet east of green house, at end of lane west; T road south	45 28 12.3	93 29 55.5	.....
Blue Lake, on east side of, at fence east, center of road; probably on line between secs. 6 and 31, Tps. 34 and 35 N., R. 25 W.	45 28 18.5	93 29 49.1	785
T. 35 N., R. 25 W., corner secs. 29, 30, 31, and 32, 10 feet west of T road east	45 29 12.0	93 29 29.8	5,594
T. 35 N., R. 25 W., in NW. ¼ sec. 29, at top of rise at northeast corner of T road south, 125 feet north of small frame shack; iron post stamped "Prim. Trav. Sta. No. 9, 1915, Minn."	45 29 47.0	93 29 07.5	3,882

Along highways near north border of quadrangle.

T. 35 N., Rs. 24 and 25 W., 20 feet south and 20 feet west of corner of secs. 19, 30, 24, and 25, at Union Mercantile Co.'s store at Oxlip; iron post stamped "Prim. Trav. Sta. No. 10, 1915, Minn."	45 29 59.6	93 23 20.1	.....
T. 35 N., R. 24 W., on line between secs. 27 and 28, at south end of Lake Francis; road south	45 29 54.4	93 19 39.0	.....
T. 35 N., R. 24 W., quarter corner secs. 25 and 26; T road east	45 29 35.5	93 17 10.7	.....
Isanti, at public-school building; crossroads	45 29 34.8	93 15 02.8	9,112

Magnetic declination for north border of quadrangle, 8° E.; for south border, 8° 26′ E.; for east border, 8° 37′ E.; for west border, 7° 36′ E.; for center, 8° 16′ E.

WALBO QUADRANGLE.

Along highway near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Baxte Lake, near east edge of, at fence line, between secs. 20 and 29, T. 35 N., R. 25 W.; center of road	45 30 03.8	93 28 51.0	.....
T. 35 N., R. 25 W., quarter corner between secs. 20 and 21; T road north	45 30 29.6	93 28 16.1	3,601
T. 35 N., R. 25 W., center of sec. 21; T road west	45 30 29.1	93 27 39.5	2,609
T. 35 N., R. 25 W., corner secs. 21, 22, 27, and 28; T road south	45 30 02.9	93 27 02.7	3,727
T. 35 N., R. 25 W., quarter corner between secs. 22 and 27; T road west	45 30 02.7	93 26 25.7	2,635
T. 35 N., R. 25 W., 0.25 mile north of corner of secs. 22, 23, 26, and 27, at north-south section line; center of east-west road	45 30 15.4	93 25 48.7	2,934
T. 35 N., R. 25 W., quarter corner between secs. 23 and 26, 1,320 feet north of T road east; center of north-south road	45 30 01.8	93 25 11.6	2,988
T. 35 N., R. 25 W., corner secs. 23, 24, 25, and 26; roads northeast and southwest	45 30 00.4	93 24 34.4	2,651
T. 35 N., R. 24 W., corner secs. 19, 20, 29, and 30; T road north	45 30 00.2	93 22 06.4	.....
T. 35 N., R. 24 W., corner secs. 20, 21, 28, and 29; T road south	45 30 01.6	93 20 53.3	5,213
T. 35 N., R. 24 W., corner secs. 22, 23, 26, and 27; crossroads	45 30 02.1	93 18 24.5	.....
T. 35 N., R. 24 W., corner secs. 23, 24, 25, and 26; T road west	45 30 01.6	93 17 10.5	5,276

Magnetic declination near south border of quadrangle 8° E.

Belle Prairie, Brainerd, Browerville, Cushing, Lastrup, Little Falls, Motley, Pine River, Swanville, and Sylvan quadrangles.

CASS, CROW WING, MORRISON, AND TODD COUNTIES.

The following geographic positions on North American datum were determined by J. H. Wilson in 1915 and are based upon United States Coast and Geodetic Survey and Mississippi River Commission triangulation and United States Geological Survey primary traverse of 1912. The latter is described in Bulletin 551.

BELLE PRAIRIE QUADRANGLE.

Along Northern Pacific Railway and highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Big Mound triangulation station, Mississippi River Commission, in NE. ¼ sec. 23, T. 132 N., R. 30 W., about 4 miles above old Fort Ripley, on right bank of the Mississippi River and 1.5 miles from river. It is on the top of the largest mound in the vicinity, which is the largest mound east of Chadwick Lake. A small log cabin stands at the junction of the above road with the river road. Station mark, tile and pipe	46 13 52.5	94 25 11.2	.....
T. 132 N., Rs. 29 and 30 W., corner of secs. 18, 19, 13, and 24, 120 feet west of; gate in west and east fence line	46 14 18.4	94 23 31.0	7,517
Road northwest about 90 feet from river bank	46 13 10.4	94 23 46.3	6,970
Road west on line between secs. 25 and 36, T. 132 N., R. 30 W., 75 feet from river bank	46 12 27.4	94 23 39.7	4,389
Tps. 131 and 132 N., Rs. 29 and 30 W., corner of, in line with roads east and south, 30 feet west and 80 feet north of above corner is in line with roads west and north, exact corner of townships not ascertained because of roads being out of alignment	46 11 40.7	94 23 31.0	4,769
T. 131 N., Rs. 29 and 30 W., corner of secs. 1, 12, 6, and 7, T road east	46 10 48.8	94 23 31.0	5,260
Bend in road in line with road north and road west	46 10 09.4	94 23 31.5	3,995
Fort Ripley triangulation station; Mississippi River Commission; tile and pipe on right bank of river, 1 mile west of blockhouses at at old Fort Ripley, near center of large concave bend in crest of bluff, 5 meters from crest of bluff at lower side of grove of black oak trees, and about 50 meters east of mouth of large ravine	46 10 19.0	94 23 45.0	1,361
T. 131 N., R. 29 W., corner of secs. 5, 6, 7, and 8, center of road in line with fence north	46 10 46.9	94 22 15.6	.....

BELLE PRAIRIE QUADRANGLE—Continued.

Along Northern Pacific Railway and highways near north border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Fort Ripley, 1 mile above, west end of bridge over Mississippi River	46 10 48.5	94 22 00.4	1,080
Railroad crossing	46 11 35.8	94 21 51.6	4,833
T. 43 N., R. 32 W., railroad crossing on line between secs. 15 and 22	46 12 03.7	94 21 54.8	2,839
T. 43 N., R. 32 W., railroad crossing on line between secs. 10 and 15	46 12 55.2	94 21 39.8	5,328
Railroad crossing just southeast of Thunder Lake	46 13 51.8	94 21 18.8	5,920
T. 43 N., R. 32 W., corner of secs. 1, 2, 11, and 12	46 13 48.7	94 20 03.8	5,285
T. 43 N., Rs. 31 and 32 W., corner of secs. 1, 12, 6, and 7; crossroads	46 13 46.0	94 18 49.2	5,247
T. 43 N., R. 31 W., corner of secs. 5, 6, 7, and 8; center of east and west road, 810 feet west of crossroads	46 13 47.4	94 17 33.9	5,300
T. 43 N., R. 31 W., corner of secs. 4, 5, 8, and 9; center of east and west road at fence south just east of J. E. Stuard's residence	46 13 47.2	94 16 18.4	5,310
T. 43 N., R. 31 W., corner of secs. 3, 4, 9, and 10; crossroads at schoolhouse	46 13 46.5	94 15 03.5	5,260
Prim. Trav. Sta. No. 28, 1912 (Bull. 551, p. 235)	46 13 46.0	94 13 48.9	5,248

Along highways near east border of quadrangle.

Road south one-half mile southwest of St. Mathias Church	46 13 01.2	94 15 40.8	.....
T. 43 N., R. 31 W., quarter corner between secs. 9 and 16; center of small wooden bridge about 450 feet north of bridge over Nokay River	46 12 54.6	94 15 40.7	680
T. 43 N., R. 31 W., quarter corner between secs. 16 and 21, T road east, 250 feet south of T road west, No. 16 schoolhouse	46 12 02.2	94 15 40.8	5,300
T. 43 N., R. 31 W., quarter corner between secs. 21 and 28	46 11 10.5	94 15 41.4	5,242
T. 43 N., R. 31 W., corner stake of secs. 20, 21, 28, and 29, in east and west road	46 11 10.8	94 16 19.4	2,678
Tps. 42 and 43 N., R. 31 W., approximate corner of secs. 5, 6, 31, and 32; crossroads, Crow Wing-Morrison county line	46 09 26.0	94 17 31.3	11,767
T. 42 N., R. 31 W., corner of secs. 5, 6, 7, and 8; crossroads	46 08 36.0	94 17 36.2	5,077
T. 42 N., R. 31 W., approximate corner of secs. 4, 5, 8, and 9; east and west road in line with road south	46 08 32.7	94 16 18.5	5,483
T. 42 N., R. 31 W., corner of secs. 8, 9, 16, and 17; T road east	46 07 40.8	94 16 22.2	5,273
T. 42 N., R. 31 W., corner of secs. 16, 17, 20, and 21, 10 feet south and 5 feet east of; on south side of east and west road at T road north; iron post stamped "Prim. Trav. Sta. No. 18, 1915, Minn."	46 06 48.5	94 16 18.7	5,300
T. 42 N., R. 31 W., corner of secs. 20, 21, 28, and 29; T road south	46 05 56.6	94 16 15.2	5,262
T. 42 N., R. 31 W., corner of secs. 28, 29, 32, and 33; T road north, 0.25 mile west of schoolhouse	46 05 03.8	94 16 13.7	5,346
T. 41 N., R. 31 W., corner of secs. 20, 21, 28, and 29; T road west	46 00 44.7	94 16 14.3	.....

Along highways near west border of quadrangle.

T. 129 N., R. 30 W., corner of secs. 5, 6, 7, and 8; center of north and south road at fence line	46 00 22.3	94 29 36.8	.....
Tps. 129 and 130 N., R. 30 W., corner of secs. 5, 6, 31, and 32; T fence east	46 01 14.1	94 29 36.9	5,250
T. 131 N., R. 30 W., corner of secs. 17, 18, 19, and 20; right-angle bend in road	46 09 03.7	94 29 44.9	.....
T. 131 N., R. 30 W., corner of secs. 7, 8, 17, and 18; center of north and south road 160 feet north of crossroads	46 09 56.2	94 29 45.6	5,315
T. 131 N., R. 30 W., corner of secs. 5, 6, 7, and 8, 0.25 mile east of; center of north and south road at east and west section line	46 10 48.7	94 29 28.4	5,462
Southeast corner of schoolhouse	46 11 21.5	94 29 27.9	3,328
Roads, south, east, and northwest, line between Tps. 131 and 132 N., about 0.25 mile east of corner of secs. 5, 6, 31, and 32	46 11 39.9	94 29 27.9	1,870
Road forks on east edge of Lake Alexander	46 12 00.4	94 29 58.6	2,997
T. 132 N., R. 30 W., corner of secs. 29, 30, 31, and 32; right angle bend in road 0.25 mile east of Lake Alexander	46 12 31.7	94 29 46.7	3,291
T. 132 N., R. 30 W., corner of secs. 19, 20, 29, and 30; 70 feet east of road west at Rail Prairie	46 13 23.8	94 29 46.2	5,284
T. 132 N., R. 30 W., corner of secs. 17, 18, 19, and 20; crossroads at schoolhouse	46 14 15.7	94 29 47.1	5,255

Along highways through center of quadrangle.

T. 131 N., R. 30 W., corner of secs. 29, 30, 31, and 32; center of east and west road at fence line	46 07 18.5	94 29 42.7	.....
T. 131 N., R. 30 W., corner of secs. 28, 29, 32, and 33; center of east and west road at fence south	46 07 18.4	94 28 28.3	5,240
T. 131 N., R. 30 W., quarter corner between secs. 27 and 28; T road west on west side of Round Lake	46 07 45.3	94 27 12.8	5,980

BELLE PRAIRIE QUADRANGLE—Continued.

Along highways through center of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Center of road forks at road northwest, line between secs. 27 and 34, T. 131 N. R. 30 W.	46 07 20.0	94 26 38.1	3,542
Center of crossroads just east of swamp	46 07 16.5	94 26 00.0	2,708
Center of triangle at road forks at southeast corner of clearing where house originally stood	46 07 33.7	94 25 21.4	3,228
Crossroads, east and west section line	46 07 19.6	94 24 18.9	4,634
T. 131 N., Rs. 29 and 30 W., corner of secs. 30, 31, 25, and 36	46 07 20.8	94 23 26.4	3,700
T. 131 N., R. 29 W., on east side of river road, at road west in sec. 30, 230 feet south of small iron bridge over small creek; iron post stamped "Prim. Trav. Sta. No. 23, 1915, Minn."	46 07 27.3	94 22 28.5	4,132
Road forks, at road west, just east of elm tree with DeLaval Cream Separator's sign and 460 feet below upper prong of same road fork	46 08 24.9	94 22 53.3	6,091
Center of river road directly over pipe culvert just north of gates on both sides of road	46 08 52.8	94 22 39.9	2,982

Magnetic declination for north border of quadrangle, 8° E.; for east border, 8¾° E.; for south border, 8¼° E.; for west border, 8¾° E.; for center, 8½° E.

BRAINERD QUADRANGLE.

Near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 133 N., R. 28 W., corner of secs. 5, 6, 7, and 8	46 21 16.1	94 14 39.7	.....

BROWERVILLE QUADRANGLE.

Along highways near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 132 N., R. 32 W., corner of secs. 29, 30, 31, and 32; T lane east	46 12 33.5	94 45 06.2	.....
Tps. 131 and 132 N., R. 32 W., corner of secs. 5, 6, 31, and 32, center of north-south road in line with fence, west	46 11 41.3	94 45 06.8	5,292
T road west at quarter corner	46 11 15.2	94 45 07.1	2,650
T. 131 N., R. 32 W., corner of secs. 5, 6, 7, and 8; T road west	46 10 48.9	94 45 07.2	2,660
T. 131 N., R. 32 W., corner of secs. 7, 8, 17, 18; crossroads	46 09 56.6	94 45 07.4	5,300
Road forks at road north near northwest corner of Rice Lake	46 09 14.8	94 45 07.0	4,241
T. 131 N., R. 32 W., center of north-south road, at telephone line west between secs. 18 and 19	46 09 04.0	94 45 25.4	1,695
T. 131 N., R. 32 W., 15 feet north and 15 feet east of center of crossroads, 15 feet north of line between secs. 19 and 30, and about 0.25 mile west of corner of secs. 19, 20, 29, and 30; iron post stamped "Prim. Trav. Sta. No. 26, 1915, Minn"	46 08 11.6	94 45 25.9	5,309
Crossroads just south of Thunder Lake	46 06 53.7	94 45 20.1	7,907
Tps. 130 and 131 N., R. 32 W., road forks at road southwest near northwest corner of Round Lake, 20 feet north of line between secs. 6 and 31	46 06 27.6	94 45 39.1	.....
Long Lake, about 200 feet west of, gate in fence	46 05 39.4	94 46 16.9	5,561
T. 130 N., R. 33 W., stake at quarter corner between secs. 1 and 12, bend in road	46 05 34.0	94 46 53.9	2,667
T. 130 N., R. 33 W., quarter corner between secs. 12 and 13, T road north	46 04 41.8	94 46 54.2	5,292
T. 130 N., R. 33 W., corner of secs. 11, 12, 13, and 14, crossroads at concrete block schoolhouse	46 04 41.3	94 47 31.7	2,645
T. 130 N., R. 33 W., corner of secs. 13, 14, 23, and 24, T road east	46 03 49.3	94 47 32.9	5,275
T. 130 N., R. 33 W., quarter corner between secs. 25 and 26, east-west road at fence south	46 02 31.2	94 47 33.8	7,912
T. 130 N., Rs. 32 and 33 W., quarter corner between secs. 25 and 30, T road south	46 02 31.9	94 46 18.4	5,310
T. 130 N., R. 32 W., road south on line between secs. 29 and 30, at northwest corner of cleared field	46 02 35.7	94 45 05.4	5,163

BROWERVILLE QUADRANGLE—Continued.

Along highways near east border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Lone triangulation station (C. & G. S.); in the NE. ¼ SE. ¼ sec. 29, T. 130 N., R. 32 W., the high sharp hill on which it is located is quite prominent, two trees on it; about 0.5 mile from the middle of the east side of Lake McClure, in Hartford Township; it is 5 miles north and 6 miles east from Long Prairie on the Great Northern Railway; station mark: A terra-cotta pipe set in concrete	46 02 24.6	94 43 59.6	4,777
T. 130 N., R. 32 W., corner of secs. 29, 30, 31, and 32, T road west	46 02 05.7	94 45 05.8	5,047
Tps. 129 and 130 N., R. 32 W., corner of secs. 5, 6, 31, and 32, 10 feet south of, in south side of east-west road on line with T road north; iron post stamped "Prim. Trav. Sta. No. 28, 1915, Minn."	46 01 13.4	94 45 07.4	5,308

Magnetic declination for east border of quadrangle, 9¼° E.

CUSHING QUADRANGLE.

Along highways near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 130 N., Rs. 30 and 31 W., quarter corner between secs. 31 and 36	46 01 39.7	94 30 52.1	.....
T. 130 N., Rs. 30 and 31 W., corner of secs. 30, 31, 25, and 36, T road west	46 02 05.9	94 30 52.8	2,655
T. 130 N., Rs. 30 and 31 W., corner of secs. 19, 30, 24, and 25, T road west	46 02 58.1	94 30 55.3	5,290
T. 130 N., Rs. 30 and 31 W., corner of secs. 18, 19, 13, and 24, T road west	46 03 50.6	94 30 52.3	5,318
T. 130 N., Rs. 30 and 31 W., corner of secs. 7, 18, 12, and 13, center of east-west road at fence line east, 470 feet south of bridge over Little Elk River	46 04 42.2	94 30 52.6	5,230
T. 130 N., Rs. 30 and 31 W., quarter corner between secs. 7 and 12, T road east	46 05 08.4	94 30 52.8	2,655
T. 130 N., Rs. 30 and 31 W., corner of secs. 6, 7, 1, and 12, T road south, 0.5 mile west of Randall	46 05 35.0	94 30 53.3	2,694
Randall, main track at east-west road crossing, about 1,000 feet northwest of depot	46 05 35.5	94 30 18.1	2,485
Randall, 1 mile north of, T road east on east-west section line	46 06 26.6	94 30 15.1	5,179
Randall, 2 miles north of, at southwest corner of crossroads at district 85 schoolhouse, 30 feet south and 25 feet west of quarter corner between secs. 30 and 31, T. 131 N., R. 30 W., iron post stamped "Prim. Trav. Sta. No. 22, 1915, Minn."	46 07 18.2	94 30 20.4	5,238
T. 131 N., Rs. 30 and 31 W., corner of secs. 30, 31, 25, and 36	46 07 18.1	94 30 51.6	2,199
T. 131 N., Rs. 30 and 31 W., corner of secs. 19, 30, 24, and 25, T road west	46 08 10.2	94 30 54.0	5,284
T. 131 N., Rs. 30 and 31 W., quarter corner between secs. 19 and 24, T road east	46 08 36.4	94 30 54.5	2,650
Johnson triangulation station (C. & G. S.). In the northern half of SW. ¼ sec. 7, T 131 N., R. 30 W., on the highest part of a mound on a prominent brush-covered hill. In Prairie Township, 0.5 mile northwest of the Randall and Alexander wagon road, on land belonging to Ed. Johnson, whose house is 95 paces from station. Station mark: A terra cotta pipe set in concrete	46 10 22.0	94 30 42.7	.....

Along highways near north border of quadrangle.

T. 132 N., Rs. 30 and 31 W., corner of secs. 18, 19, 13, and 24, crossroads	46 14 15.2	94 30 57.4	.....
T. 132 N., R. 31 W., corner of secs. 13, 14, 23, and 24, corner stake in small open swamp, 350 feet east of east end of graded road	46 14 14.3	94 32 12.5	5,280
T. 132 N., R. 31 W., corner of secs. 14, 15, 22, and 23, crossroads	46 14 13.5	94 33 27.2	5,258
T. 132 N., R. 31 W., corner of secs. 15, 16, 21, and 22, T road south	46 14 14.5	94 34 42.0	5,258
T. 132 N., R. 31 W., corner of secs. 16, 17, 20, and 21, stake in center of east-west road, at north and south fence line	46 14 14.5	94 35 58.0	5,340
T. 132 N., R. 31 W., corner of secs. 17, 18, 19, and 20, fence south	46 14 16.3	94 37 13.3	5,297
Lincoln, 2 miles north of, at bend in road, 30 feet south of gate and 20 feet south of approximate corner of secs. 18, 19, 13, and 24, Morrison-Todd county line; iron post stamped "Prim. Trav. Sta. No. 24, 1915, Minn." (NOTE.—West tier of sections in R. 31 W. are long)	46 14 17.2	94 38 50.2	6,817
Lincoln, 1 mile north of, corner of secs. 19, 30, 24, and 25, T road east, county line	46 13 26.8	94 38 50.0	5,105
Staples Auto Club sign at road forks	46 14 12.2	94 39 34.1	5,549

CUSHING QUADRANGLE—Continued.

Along highways near north border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Road forks, 30 feet southwest of jackpine tree with sign reading "Motley 6½ miles"	46 14 47.3	94 39 40.4	3,577
North end of bridge over Fish Trap Creek, 750 feet north and 10 feet east of stake in center of sec. 16, T. 132 N., R. 32 W.	46 14 51.5	94 43 12.9	.....
Road forks, at road north, about 150 feet southeast of concrete-block house	46 13 25.9	94 43 27.5	8,731
T. 132 N., R. 32 W., corner of secs. 20, 21, 28, and 29, center of east and west road, at fence line	46 13 25.9	94 43 50.7	1,630
T. 132 N., R. 32 W., about 900 feet east of corner of secs. 19, 20, 29, and 30, 15 feet north and 5 feet east of T road south at schoolhouse; iron post stamped "Prim. Trav. Sta. No. 25, 1915, Minn."	46 13 24.8	94 44 53.3	4,405

Along highways near south border of quadrangle.

Tps. 129 and 130 N., R. 32 W., corner of secs. 4, 5, 32, and 33; flag-pole, 20 feet west of north-south telephone line	46 01 13.0	94 43 52.4	.....
Gate in fence	46 01 22.8	94 41 46.8	8,922
T. 130 N., R. 32 W., center of north-south road at line between secs. 34 and 35	46 01 30.9	94 41 22.6	1,899
J. Schrupp's mail box at road northwest	46 01 13.7	94 40 46.0	3,109
Tps. 129 and 130 N., R. 32 W., corner of secs. 1, 2, 35, and 36, fence corner 25 feet south of road forks at road north	46 01 14.6	94 40 07.8	2,698
T. 129 N., Rs. 31 and 32 W., quarter corner between secs. 1 and 6; 15 feet north and 15 feet west of, set at northwest corner of T road east, Morrison-Todd county line; iron post stamped "Prim. Trav. Sta. No. 29, 1915, Minn."	46 00 47.2	94 38 52.4	6,010
Center of gate at northwest corner of barn-yard; about 250 feet northwest of white-washed frame house, on top of hill	46 00 49.1	94 37 53.1	4,190
Tps. 129 and 130 N., R. 31 W., corner of secs. 5, 6, 31, and 32, center of east and west road, 20 feet east of west end of small swamp which is about 150 feet wide, no stake or fence but corner was pointed out by old settler	46 01 16.2	94 37 06.3	4,297
Tps. 129 and 130 N., R. 31 W., corner of secs. 4, 5, 32, and 33, cross-roads	46 01 15.7	94 35 51.1	5,305
T. 129 N., R. 31 W., corner of secs. 4, 5, 8, and 9, T road east	46 00 20.7	94 35 51.3	5,570
T. 129 N., R. 31 W., corner of secs. 3, 4, 9, and 10, center of east-west road at fence line	46 00 21.4	94 34 36.4	5,289
T. 129 N., R. 31 W., quarter corner between secs. 3 and 10, cross-roads	46 00 21.5	94 33 59.5	2,610
T. 129 N., R. 31 W., corner of secs. 2, 3, 10, and 11, center of east-west road at fence line	46 00 21.7	94 33 22.2	2,630
T. 129 N., R. 31 W., quarter corner between secs. 2 and 11, cross-roads	46 00 21.9	94 32 44.3	2,680
T. 129 N., R. 31 W., corner of secs. 1, 2, 11, and 12, center of east-west road at fence north, 20 feet west of T lane north	46 00 21.7	94 32 06.9	2,640
Cross-roads; north-south section line	46 00 07.4	94 30 51.1	5,542

Along highways through center of quadrangle.

Road forks near southeast corner of Thunder Lake, roads east, west, and southwest	46 06 46.9	94 44 48.0	.....
T. 131 N., R 32 W., line between secs. 32 and 33, bend in road in line with road south and road east; about 250 feet southeast of yellow frame house	46 07 09.9	94 43 51.9	4,592
T. 131 N., R. 32 W., corner of secs. 27, 28, 33, and 34, center of east-west road at center of line south between north-south fences about 60 feet apart, just north of Pine Island Lake, and about 300 feet west of green residence on north side of road	46 07 20.2	94 42 36.5	5,411
T. 131 N., R. 32 W., center of sec. 26, fence corner at right angle bend in road	46 07 45.3	94 40 44.2	8,303
T. 131 N., R. 32 W., corner of secs. 23, 24, 25, and 26, center of east-west road, 15 feet north of fence corner at northeast corner of Tippey's farm, 15 feet northwest of white pine stump	46 08 12.0	94 40 06.8	3,777
T. 131 N., Rs. 31 and 32 W., corner of secs. 19, 30, 24, and 25, 20 feet north and 4 feet west of; iron post set on north side of east-west road, 4 feet west and 1 foot south of fence north on Morrison-Todd county line, about 650 feet east of schoolhouse; iron post stamped "Prim. Trav. Sta. No. 27, 1915, Minn."	46 08 13.1	94 38 50.8	5,345
T. 131 N., R. 31 W., corner of secs. 19, 20, 29, and 30, center of east-west road at telephone line north, 250 feet west of wooden bridge	46 08 14.0	94 37 09.2	7,156
Center of wooden culvert	46 08 38.4	94 35 53.1	5,901
Cushing railroad crossing, main track, about 100 feet northwest of depot	46 08 22.6	94 34 37.3	5,573

CUSHING QUADRANGLE—Continued.

Along highways through center of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 131 N., R. 31 W., corner of secs. 22, 23, 26, 27, roads east and northwest and cut-out line south	46 08 11.4	94 33 23.6	5,316
T. 131 N., R. 31 W., corner of secs. 23, 24, 25, and 26, crossroads at schoolhouse	46 08 11.4	94 32 09.0	5,250

Magnetic declination for east border of quadrangle, 8¾° E.; for north border, 9¼° E.; for center, 9½° E.; for south border, 9¼° E.; for west border, 9¼° E.

MOTLEY QUADRANGLE.

Along highways near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 133 N., R. 30 W., quarter corner between secs. 7 and 18, T road north	46 20 24.7	94 30 21.7	.....
T. 133 N., R. 30 W., quarter corner between secs. 6 and 7, center of north and south road, line west is cut out	46 21 17.0	94 30 23.6	5,300
Road forks, 5 feet north and 12 feet west of advertising sign on jack-pine tree	46 22 41.2	94.31.13.8	9,228
T. 134 N., Rs. 30 and 31 W., big square stone at corner of secs. 25, 30, 31, and 36, just south of bend in road at south end of north-south road	46 23 01.0	94 31 03.6	2,125
T. 134 N., Rs. 30 and 31 W., corner of secs. 24, 25, 19, and 30, 30 feet south and 25 feet east of, at southeast corner of crossroads ½ mile south of Fairview schoolhouse; iron post stamped "Prim. Trav. Sta. No. 13, 1915, Minn."	46 23 53.1	94 31 03.6	5,274
T. 134 N., Rs. 30 and 31 W., stone corner of secs. 13, 24, 18, and 19, crossroads	46 24 45.8	94 31 05.3	5,340
T. 134 N., Rs. 30 and 31 W., corner of secs. 7, 18, 12, and 13; iron pipe	46 25 38.1	94 31 06.6	5,298
T. 134 N., Rs. 30 and 31 W., corner of secs. 6, 7, 1, and 12, wooden hub on transit line	46 26 30.1	94 31 07.8	5,270
Sunrise schoolhouse, 1 mile east of, second-class road at cut-out north-south section line	46 26 30.6	94 31 07.8	50
Gate in east-west fence	46 26 42.8	94 30 26.0	3,176

Near south border of quadrangle.

T. 132 N., R. 32 W., approximate corner of secs. 11, 12, 13, and 14, tall jack-pine tree with signboard reading "Philbrook"; just north of east-west road, 420 feet west of gate in fence	46 15 10.8	94 40 05.8	.....
Philbrook, 2.5 miles southeast of, east-west railroad crossing, apparently east-west section line	46 15 12.6	94 41 17.7	5,055
Road forks, 900 feet northeast of abandoned log house	46 15 02.2	94 42 12.5	3,994

Magnetic declination for east border of quadrangle, 9° E.; for south border, 9¼° E.

LASTRUP QUADRANGLE.

Along highways near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 42 N., R. 31 W., corner of secs. 27, 28, 33, and 34, T road north	46 05 03.3	94 14 58.6	.....
T. 42 N., R. 31 W., corner of secs. 26, 27, 34, and 35, T road south	46 05 05.4	94 13 44.6	5,216
Tps. 41 and 42 N., R. 31 W., corner of secs. 2, 3, 34, and 35, crossroads	46 04 12.6	94 13 43.2	5,340
T. 41 N., R. 31 W., corner of secs. 2, 3, 10, and 11; crossroads	46 03 21.8	94 13 41.9	5,150
T. 41 N., R. 31 W., corner of secs. 10, 11, 14, and 15, crossroads	46 02 29.2	94 13 44.1	5,327
T. 41 N., R. 31 W., corner of secs. 14, 15, 22, and 23, crossroads	46 01 37.3	94 13 43.2	5,260
T. 41 N., R. 31 W., corner of secs. 22, 23, 26, and 27, T road west	46 00 45.5	94 13 44.0	5,252
T. 41 N., R. 31 W., corner of secs. 21, 22, 27, and 28, 15 feet north of fence corner	46 00 45.3	94 14 59.3	5,320

Magnetic declination for west border of quadrangle, 8¾° E.

LITTLE FALLS QUADRANGLE.

Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 41 N., R. 31 W., corner of secs. 28, 29, 32, and 33, 15 feet south and 5 feet east of, in south side of east-west road at T road north; iron post stamped "Prim. Trav. Sta. No. 19, 1915, Minn."	45 59 52.0	94 16 14.8	.....
T. 41 N., R. 31 W., corner of secs. 29, 30, 31, and 32, center of east-west road at fence south	45 59 52.0	94 17 30.3	5,330
T. 41 N., Rs. 31 and 32 W., corner of secs. 30, 31, 25, and 26, center of east-west road at fence line	45 59 51.2	94 18 47.3	5,440
T. 41 N., R. 32 W., quarter corner between secs. 25 and 36, T road east	45 59 51.4	94 19 24.9	2,655
Calvary Cemetery, center of east-west road in front of gate	45 59 25.6	94 20 40.3	5,935
Road east, 335 feet west of railroad crossing	45 59 25.6	94 21 07.2	1,893
Little Falls, intersection of Fifth Street and Seventh Avenue NE.	45 59 02.9	94 21 13.4	2,335
Little Falls, spire of public-school building, originally the high school	45 58 38.2	94 21 27.6	2,699
Little Falls, west end of Broadway Street Bridge over Mississippi River	45 58 38.0	94 22 08.8	2,914
Little Falls, southwest corner of T road south, 1,340 feet west of Broadway Street Bridge; iron post stamped "Prim. Trav. Sta. No. 20, 1915, Minn."	45 58 37.2	94 22 27.7	1,339
Little Falls, cross streets at west edge of, corner of secs. 18, 19, 13, and 24, T. 129 N., Rs. 29 and 30 W.	45 58 36.6	94 23 15.9	3,407
Railroad crossing	45 58 36.9	94 24 07.8	3,665
T. 129 N., R. 30 W., corner of secs. 13, 14, 23, and 24, crossroads	45 58 36.7	94 24 31.2	1,655
T. 129 N., R. 30 W., corner of secs. 14, 15, 22, and 23, center of east-west road in line with north-south road	45 58 36.9	94 25 46.3	5,300
T. 129 N., R. 30 W., approximate corner of secs. 15, 16, 21, and 22, 35 feet north of east-west road	45 58 37.6	94 27 02.3	5,370
T. 129 N., R. 30 W., quarter corner between secs. 16 and 21, crossroads	45 58 37.4	94 27 40.5	2,700
Center of road at north-south section line	45 58 48.3	94 28.19.4	2,959
T. 129 N., R. 30 W., corner of secs. 17, 18, 19, and 20, center of east-west road at fence line	45 58 37.5	94 29 35.7	5,496

Magnetic declination for north border of quadrangle 8¼° E.

PINE RIVER QUADRANGLE.

Along highways near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Prim. Trav. Sta. No. 32, 1912	46 29 37.0	94 13 30.9	.....
Hubert, railroad crossing just west of depot	46 30 05.1	94 15 25.2	8,489
Railroad crossing at north and south section line	46 30 18.8	94 15 57.5	2,652
Nisswa, railroad crossing just east of depot	46 31 15.6	94 17 18.7	8,088
Railroad crossing east-west section line	46 31 43.8	94 17 41.3	3,265
Road forks, 30 feet south of sign reading "Pine River Garage 15½ miles"	46 31 54.4	94 18 05.9	2,027
Road forks at road leading to Knudsen's farm	46 31 47.2	94 18 29.1	1,774
Road forks at blind trail down lake	46 31 29.8	94 19 04.4	3,035
Fence corner	46 32 02.6	94 20 07.8	5,542
Road forks, 25 feet northeast of W. Erickson's mail box	46 32 19.0	94 20 14.7	1,724
Gull Lake, center of bridge over inlet to	46 32 23.8	94 20 32.8	1,360
T. 135 N., R. 29 W., corner of secs. 5, 6, 7, and 8, T road south at Geo. Gehweier's mail box	46 31 44.8	94 22 19.3	8,427
T. 135 N., R. 29 W., corner of secs. 7, 8, 17, and 18, 15 feet south and 15 feet west of, on east side of north and south road, 460 feet south of Jud. Bressler's mail box; iron post stamped "Prim. Trav. Sta. No. 1, 1915, Minn."	46 30 52.2	94 22 19.3	5,327
T. 135 N., R. 29 W., corner of secs. 17, 18, 19, and 20, 25 feet south and 30 feet west of, at southwest corner of crossroads at Portview schoolhouse; iron post stamped "Prim. Trav. Sta. No. 2, 1915, Minn."	46 30 00.0	94 22 20.0	5,296
Center of road on grade of old narrow-gage logging road at blind trail leading south, about 300 feet south of log cabin and 50 feet north of lone oak tree having no bark on its north side	46 30 34.3	94 24 19.0	9,024
Cross trails on old grade	46 31 04.6	94 25 08.2	4,605
T. 135 N., R. 30 W., on line between secs. 10 and 11, T road south at Collins-Cole mail box	46 31 26.0	94 26 03.0	4,405
Center of road at north and south line, 400 feet east of road north at 3 mail boxes	46 31 43.2	94 27 17.9	5,526
Crossroads, 1,815 feet north of corner of secs. 4, 5, 8, and 9, T. 135 N., R. 30 W	46 32 01.9	94 28 33.2	5,591
T. 135 N., R. 30 W., corner of secs. 4, 5, 8, and 9	46 31 44.0	94 28 32.4	1,815

PINE RIVER QUADRANGLE—Continued.

Along highways near south border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 135 N., R. 30 W., corner of secs. 8, 9, 16, and 17, crossroads at Gillman schoolhouse	46 30 52.4	94 28 32.2	5,231
Fire tower at southwest corner of T road west at quarter corner between secs. 16 and 17, T. 135 N., R. 30 W.	46 30 26.3	94 28 32.8	2,635
T. 135 N., R. 30 W., corner of secs. 16, 17, 20, and 21, 25 feet south and 30 feet west of, at southwest corner o. T road west; iron post stamped "Prim. Trav. Sta. No. 3, 1915, Minn."	46 30 00.2	94 28 33.1	2,645

Magnetic declination for south border of quadrangle, 8½° E.

SWANVILLE QUADRANGLE.

Near northeast corner of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 129 N., Rs. 30 and 31 W., corner of secs. 18, 19, 13, and 24, 30 feet south and 25 feet west of; iron post set at southwest corner of crossroads stamped "Prim. Trav. Sta. No. 21, 1915, Minn."	45 58 37.1	94 30 52.1	.....
T. 129 N., Rs. 30 and 31 W., corner of secs. 7, 18, 12, and 13, T road west	45 59 29.5	94 30 51.4	5,308

Magnetic declination for quadrangle, 7° 45′ E.

SYLVAN QUADRANGLE.

Along Northern Pacific Railway through center of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 133 N., Rs. 28 and 29 W., center of railroad at line between secs. 7 and 12, fence south, just south of east end of tangent and 990 feet east of milepost 122	46 20 54.9	94 15 54.9	.....
Railroad crossing, second class	46 20 48.4	94 16 20.4	1,910
Baxter railroad crossing, 25 feet west of line between secs. 11 and 12, T. 133 N., R. 29 W.	46 20 35.5	94 17 10.6	3,750
Railroad at milepost 124	46 20 22.2	94 18 31.8	5,854
Railroad crossing	46 20 25.7	94 19 22.1	3,550
Crow Wing-Cass county line, railroad at north and south section line	46 20 27.3	94 19 38.1	1,130
T. 133 N., R. 29 W., railroad at line between secs. 16 and 17	46 20 23.8	94 20 52.9	5,262
Gull River, east end of railroad bridge over	46 20 20.9	94 21 13.3	1,460
T. 133 N., R. 29 W., railroad crossing 45 feet west of line between secs. 17 and 18	46 20 13.3	94 22 09.8	4,039
T. 133 N., Rs. 29 and 30 W., railroad crossing 30 feet west of line between secs. 13 and 18	46 20 08.7	94 23 25.7	5,349
Sylvan, railroad crossing at depot	46 20 05.9	94 24 28.4	4,405
T. 133 N., R. 30 W., railroad at line between secs. 13 and 14	46 20 07.3	94 24 40.5	858
T. 133 N., R. 30 W., railroad at line between secs. 14 and 15, 120 feet east of milepost No. 130	46 20 13.0	94 25 57.0	5,401
Railroad crossing	46 20 00.1	94 27 21.2	6,053
Pillager, at railroad crossing sign, 30 feet north and 20 feet east of crossing at depot, 20 feet east of north and south section line; iron post stamped "Prim. Trav. Sta. No. 12, 1915, Minn."; elevation, 1,210 feet	46 19 47.7	94 28 27.5	4,820

Along highways near west border of quadrangle.

T. 135 N., R. 30 W., corner of secs. 17, 18, 19, and 20; line is cut out east and north	46 29 58.8	94 29 48.7	.....
Home Brook, center of bridge over	46 29 59.8	94 29 16.2	2,270
T. 135 N., R. 30 W., corner of secs. 20, 21, 28, and 29, T road east	46 29 08.3	94 28 32.3	.....
T. 135 N., R. 30 W., corner of secs. 21, 22, 27, and 28, T road south	46 29 08.2	94 27 15.9	5,345
T. 135 N., R. 30 W., corner of secs. 27, 28, 33, and 34, center of north and south road	46 28 15.8	94 27 14.1	5,310
T road east at quarter corner	46 27 49.8	94 27 14.7	2,630

SYLVAN QUADRANGLE—Continued.

Along highways near west border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Tps. 134 and 135 N., R. 30 W., corner of secs. 3, 4, 33, and 34, center of north and south road at fence line, road northwest leading to Hardy Lake	46 27 24.0	94 27 15.4	2,625
Road forks at east end of Hardy Lake, in line with road east	46 27 34.3	94 28 24.5	4,950
Hardy Lake, road at outlet of	46 27 18.5	94 28 51.0	2,448
Small poplar tree on north side of road, about 100 feet east of second-class road forks; tree is blazed on the south and west sides and five nails are in blaze on west side 10 inches above ground	46 27 26.5	94 29 35.9	3,244
T. 133 N., R. 30 W., corner of secs. 7, 8, 17, and 18, center of east and west road at fence south	46 20 25.1	94 29 44.1	.....
T. 133 N., R. 30 W., quarter corner between secs. 8 and 17, cross-roads	46 20 24.5	94 29 06.1	2,665
T. 133 N., R. 30 W., corner of secs. 16, 17, 20, and 21, cross streets near south edge of Pillager	46 19 32.3	94 28 27.6	.....
T. 133 N., R. 30 W., corner of secs. 20, 21, 28, and 29, crossroads	46 18 40.7	94 28 26.3	5,240
T. 133 N., R. 30 W., corner of secs. 28, 29, 32, and 33, center of north and south road at fence line	46 17 48.6	94 28 25.4	5,280
Tps. 132 and 133 N., R. 30 W., corner of secs. 4, 5, 32, and 33, telephone line east	46 16 56.1	94 28 25.9	5,326
T. 132 N., R. 30 W., corner of secs. 4, 5, 8, and 9, telephone line east, 810 feet south of T road east	46 16 05.9	94 28 28.6	5,086
T. 132 N., R. 30 W., corner of secs. 8, 9, 16, and 17, 40 feet north and 20 feet west of, at northwest corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 16, 1915, Minn."; elevation, 1,305 feet	46 15 09.4	94 28 30.1	5,734
Home Brook schoolhouse, 20 feet north of gate and just inside of fence; iron post stamped "Prim. Trav. Sta. No. 14, 1915, Minn."; elevation, 1,293 feet	46 27 10.3	94 27 16.7	.....
T. 134 N., R. 30 W., corner of secs. 2, 3, 10, and 11, flagpole in swamp	46 26 29.6	94 26 03.4	6,585
Second-class road at dim road north	46 25 56.5	94 25 09.5	5,052
Road forks about 500 feet south of old log barn	46 25 22.4	94 24 51.0	3,686
Road forks; roads north, northeast, and southwest	46 24 56.7	94 25 01.6	2,715
Fence corner at southwest corner of fenced-in ground, east side of road	46 24 46.0	94 25 01.2	1,086
Wilson Lake, old white-pine stump at west end of, in line with roads west and south	46 23 52.0	94 25 01.0	5,468
Center of triangle at road forks on top of ridge, junction of Brainerd-Pillager roads	46 23 32.9	94 25 05.9	1,968
Nail in small oak tree, 5 feet above ground; west side of road at east end of Wilson Lake at point where Brainerd road leaves lake, about 30 feet east of lake shore	46 23 21.4	94 23 53.5	5,211
Road forks at second-class road northeast	46 23 09.5	94 22 46.9	4,821
West end of bridge over stream connecting two lakes	46 23 08.4	94 21 55.9	3,576
In angle formed by road forks on top of rise, about 570 feet southeast of bridge over stream connecting small lake with Gull Lake, and 810 feet southeast of cottage on strip of land between lakes; iron post stamped "Prim. Trav. Sta. No. 15, 1915, Minn."	46 23 04.5	94 21 50.0	568
Northeast corner of schoolhouse	46 22 13.9	94 21 35.3	5,237
Road forks, west end of triangle	46 21 31.4	94 21 26.9	4,346
Apparent line between secs. 5 and 8, T. 133 N., R. 29 W., not in road	46 21 18.0	94 21 46.4	1,926

Along highways near south border of quadrangle.

T. 132 N., R. 30 W., corner of secs. 7, 8, 17, and 18, 25 feet east of crossroads at church	46 15 07.7	94 29 45.2	.....
Prim. Trav. Sta. No. 16, 1915 (see description above)	46 15 09.4	94 28 30.1	5,276
T. 132 N., R. 30 W., stake at corner of secs. 9, 10, 15, and 16, center of east and west road; two telephone lines north, one on each side of section line	46 15 08.9	94 27 14.4	5,323
T. 132 N., R. 30 W., corner of secs. 10, 11, 14, and 15, telephone line south	46 15 10.8	94 25 59.0	5,305
T. 132 N., R. 30 W., corner of secs. 11, 12, 13, and 14, T road north	46 15 10.8	94 24 43.8	5,287
T. 132 N., Rs. 29 and 30 W., corner of secs. 7, 8, 12, and 13; 30 feet south and 25 feet west of, at northwest corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 17, 1915, Minn."; elevation, 1198 feet	46 15 10.9	94 23 29.8	5,205

On north border of quadrangle.

T. 135 N., R. 29 W., corner of secs. 17, 18, 19, and 20, 25 feet south and 30 feet west of; at southwest corner of crossroads at Portview schoolhouse; iron post stamped "Prim. Trav. Sta. No. 2, 1915, Minn."	46 30 00.0	94 22 20.0	.....

Magnetic declination for north border of quadrangle, 8½° E.; for center, 8¼° E. for west border, 9° E.; for south border, 8° E.

MINNESOTA, NORTH DAKOTA, AND SOUTH DAKOTA.

PRIMARY TRAVERSE.

Beardsley, New Effington, Marvin, Peever, Sisseton, and White Rock quadrangles.

BIG STONE AND TRAVERSE COUNTIES, MINN.; RICHLAND COUNTY, N. DAK.; ROBERTS COUNTY, S. DAK.

The following geographic positions on North American datum were determined by George T. Hawkins in 1915. Lines were run around the borders and through the center of quadrangles and tied to the following stations of the United States Coast and Geodetic Survey: Homer Siding, Enwiller, Layden, and Brown Valley southeast base.

BEARDSLEY QUADRANGLE.

Along highways near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
MINNESOTA.			
Beardsley, 1.5 miles southwest of, 30 feet north and 20 feet east of corner secs. 13, 18, 19, and 24, 4 feet from corner of fence; iron post stamped "Prim. Trav. Sta. No. 11, 1915"	° ′ ″ 45 32 44.6	° ′ ″ 96 44 25.5	*Feet.*
T. 124 N., R. 48 W., corner secs. 17, 18, 19, and 20, crossroads	45 32 43.3	96 43 11.8	5,250
T. 124 N., R. 48 W., corner secs. 16, 17, 20, and 21, crossroads	45 32 43.4	96 41 58.8	5,197
T. 124 N., R. 48 W., corner secs. 15, 16, 21, and 22, crossroads	45 32 42.8	96 40 44.3	5,300
T. 124 N., R. 48 W., corner secs. 14, 15, 22, and 23, crossroads	45 32 41.8	96 39 30.1	5,280
T. 124 N., R. 48 W., corner secs. 13, 14, 23, and 24, crossroads	45 32 40.7	96 38 15.7	5,300
T. 124 N., Rs. 47 and 48 W., 30 feet north and 60 feet east of corner secs. 13, 24, 18, and 19, and 4 feet south of corner of fence; iron post stamped "Prim. Trav. Sta. No. 12, 1915"	45 32 40.0	96 37 00.2	5,374
T. 124 N., R. 47 W., corner secs. 17, 18, 19, 20, crossroads	45 32 38.6	96 35 45.6	5,310
T. 124 N., R. 47 W., corner secs. 16, 17, 20, and 21, crossroads	45 32 37.8	96 34 31.7	5,260
T. 124 N., R. 47 W., corner secs. 15, 16, 21, and 22, crossroads	45 32 37.9	96 33 17.2	5,300
T. 124 N., R. 47 W., corner secs. 14, 15, 22, and 23, crossroads	45 32 38.2	96 32 02.4	5,328
T. 124 N., R. 47 W., 35 feet south and 20 feet east of crossroads, at corner secs. 13, 14, 23, and 24, at northwest corner of grove; iron post stamped "Prim. Trav. Sta. No. 13, 1915"	45 32 37.2	96 30 48.5	5,260
Along highways near east border of quadrangle.			
T. 124 N., R. 47 W., corner secs. 11, 12, 13, and 14, crossroads	45 33 29.7	96 30 49.7	5,316
Graceville, 4 miles west of, railway crossing	45 33 52.9	96 30 50.0	2,350
T. 124 N., R. 47 W., corner secs. 1, 2, 11, and 12, crossroads	45 34 22.0	96 30 50.0	2,950
T. 124 N., R. 47 W., north corner secs. 1 and 2, T road south	45 35 08.0	96 30 50.5	4,670
T. 125 N., Rs. 46 and 47 W., south corner secs. 31 and 36, T road north	45 35 08.1	96 30 38.7	840
T. 125 N., Rs. 46 and 47 W., corner secs. 25, 30, 31, and 36	45 35 59.9	96 30 38.1	5,250
T. 125 N., Rs. 46 and 47 W., corner secs. 24, 25, 19, and 30, T road north	45 36 52.6	96 30 38.1	5,342
T. 125 N., Rs. 46 and 47 W., 20 feet south and 30 feet west of crossroads, at corner secs. 13, 18, 19, and 24, 3 feet from corner of fence; iron post stamped "Prim. Trav. Sta. No. 14, 1915"	45 37 44.4	96 30 38.6	5,249
T. 125 N., Rs. 46 and 47 W., corner secs. 7, 12, 13, and 18, crossroads	45 38 37.0	96 30 38.5	5,329
T. 125 N., Rs. 46 and 47 W., corner secs. 1, 6, 7, and 12, crossroads	45 39 29.1	96 30 38.7	5,280
Tps. 125 and 126 N., Rs. 46 and 47 W., corner secs. 1, 6, 31, and 36, T road east	45 40 21.6	96 30 38.8	5,310
T. 126 N., Rs. 46 and 47 W., corner secs. 30, 31, 36, and 25, crossroads	45 41 13.6	96 30 38.8	5,270
T. 126 N., Rs. 46 and 47 W., corner secs. 19, 30, 24, and 25, crossroads	45 42 05.8	96 30 38.7	5,290
T. 126 N., Rs. 46 and 47 W., corner secs. 13, 24, 18, and 19, crossroads	45 42 57.9	96 30 38.7	5,280
T. 126 N., Rs. 46 and 47 W., corner secs. 12, 13, 7, and 18, crossroads	45 43 50.1	96 30 38.6	5,280
T. 126 N., Rs. 46 and 47 W., corner secs. 1, 12, 6, and 7, crossroads	45 44 42.4	96 30 38.5	5,300

BEARDSLEY QUADRANGLE—Continued.

Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
MINNESOTA.	° ′ ″	° ′ ″	*Feet.*
T. 126 N., R. 47 W., corner secs. 2, 3, 10, and 11, crossroads	45 44 42.0	96 33 07.2	
T. 126 N., R. 47 W., corner secs. 3, 4, 9, and 10, crossroads	45 44 42.2	96 34 21.8	5,290
T. 126 N., R. 47 W., corner secs. 4, 5, 8, and 9, crossroads	45 44 42.5	96 35 36.4	5,290
T. 126 N., R. 47 W., 20 feet north and 10 feet east of T road south, at corner secs. 5, 6, 7, and 8, 3 feet from corner of wire fence; iron post stamped "Prim. Trav. Sta. No. 16, 1915"	45 44 43.4	96 36 51.0	5,290
T. 126 N., R. 47 W., corner secs. 7, 8, 17, and 18, crossroads	45 43 51.3	96 36 51.0	5,272
T. 126 N., R. 47 W., corner secs. 17, 18, 19, and 20, crossroads	45 42 59.2	96 36 51.4	5,280
T. 126 N., Rs. 47 and 48 W., corner secs. 18, 19, 13, and 24, crossroads	45 42 59.2	96 38 08.9	5,497
T. 126 N., Rs. 47 and 48 W., corner secs. 24, 25, 19, and 30, crossroads	45 42 06.9	96 38 08.8	5,296
T. 126 N., R. 48 W., corner secs. 23, 24, 25, and 26, T road east	45 42 07.0	96 39 24.4	5,360
T. 126 N., R. 48 W., corner secs. 25, 26, 35, and 36, crossroads	45 41 14.9	96 39 24.3	5,280
T. 126 N., R. 48 W., corner secs. 26, 27, 34, and 35, crossroads	45 41 15.0	96 40 38.8	5,290
T. 126 N., R. 48 W., corner secs. 27, 28, 33, and 34, road north	45 41 15.4	96 41 53.0	5,270
T. 126 N., R. 48 W., corner secs. 28, 29, 32, and 33, T road south	45 41 15.4	96 43 08.7	5,369

Along highways near west border of quadrangle.

T. 125 N., R. 48 W., corner secs. 32, 33, 34, and 35, crossroads	45 40 23.1	96 43 08.1	5,291
T. 125 N., R. 48 W., quarter corner secs. 4 and 5, crossroads	45 39 57.2	96 43 08.3	2,630
T. 125 N., R. 48 W., corner secs. 4, 5, 8, and 9, crossroads	45 39 31.0	96 43 08.4	2,649
T. 125 N., R. 48 W., corner secs. 5, 6, 7, and 8, crossroads	45 39 31.1	96 44 23.5	5,330
T. 125 N., R. 48 W., corner secs. 7, 8, 17, and 18, crossroads	45 38 38.7	96 44 23.6	5,300
Layden triangulation station, U. S. Coast and Geodetic Survey (Traverse County, Minn., 1903–4) in the SW. ¼ NW. ¼ sec. 17, T. 125 N., R. 48 W., on land belonging to James Layden; station is on a prominent mound 3.5 miles north and 4.5 miles east of Brown Valley. Mark is a terra-cotta pipe 4 inches in diameter, filled with concrete, and has a 60-penny wire nail embedded in top. Reference mark is also a terra-cotta pipe with nail in top, and is at the southwest corner of section, in southwest corner of a field, and 371.128 meters from the station in azimuth 46° 27′ 31″; is 6.4 meters lower in elevation than the station. The following azimuths and distances are from the triangulation station: William Cobert's house, chimney, 96° 03′ 51″, about ¾ mile; James Layden's house, chimney, 170° 30′ 20″, about ¾ mile; windmill tower at William Boner's house, 271° 58′ 21″ about ¾ mile. The quarter corner in the center of the west side of this section is connected with the station	45 38 21.13	96 44 10.6	2,005
T. 125 N., R. 48 W., 20 feet south and 20 feet east of, corner secs. 17, 18, 19, and 20, 3 feet from corner of fence; iron post stamped "Prim. Trav. Sta. No. 17, 1915"	45 37 46.1	96 44 23.0	3,657
T. 125 N., R. 48 W., corner secs. 19, 20, 29, and 30	45 36 54.2	96 44 23.3	5,265
T. 125 N., R. 48 W., corner secs. 29, 30, 31, and 32, crossroads	45 36 02.0	96 44 23.2	5,290
T. 125 N., R. 48 W., south corner secs. 31 and 32, T road north	45 35 09.6	96 44 23.4	5,300
T. 124 N., Rs. 48 and 49 W., north corner secs. 1 and 6, T road south	45 35 09.6	96 44 26.5	220
T. 124 N., Rs. 48 and 49 W., corner secs. 1, 6, 7, and 12	45 34 28.8	96 44 26.4	4,130
Beardsley, 1 mile west of road crossing	45 33 45.4	96 44 26.1	4,400
T. 124 N., Rs. 48 and 49 W., corner secs. 7, 12, 13, and 18	45 33 36.8	96 44 26.1	870

Along highways through center of quadrangle.

T. 125 N., R. 48 W., corner secs. 16, 17, 20, and 21, crossroads	45 37 46.3	96 43 08.3	
T. 125 N., R. 48 W., corner secs. 15, 16, 21, and 22, crossroads	45 37 46.5	96 41 53.0	5,350
T. 125 N., R. 48 W., corner secs. 14, 15, 22, and 23, road north	45 37 46.4	96 40 38.4	5,300
T. 125 N., R. 48 W., corner secs. 14, 15, 10, and 11, road east	45 38 38.8	96 40 38.1	5,300
T. 125 N., R. 48 W., corner secs. 11, 12, 13, and 14, crossroads	45 38 38.4	96 39 24.6	5,220
T. 125 N., Rs. 48 and 47 W., quarter corner between secs. 13 and 18, road south	45 38 12.3	96 38 09.5	5,957
T. 125 N., Rs. 47 and 48 W., 30 feet north and 15 feet east of cross-roads at corner secs. 13, 18, 19, and 24; iron post stamped "Prim. Trav. Sta. No. 18, 1915"	45 37 46.5	96 38 09.1	2,608
T. 125 N., R. 47 W., corner secs. 17, 18, 19, and 20, crossroads	45 37 45.7	96 36 52.0	5,478
T. 125 N., R. 47 W., corner secs. 16, 17, 20, and 21, crossroads	45 37 45.8	96 35 37.3	5,310
T. 125 N., R. 47 W., corner secs. 15, 16, 21, and 22, crossroads	45 37 45.4	96 34 22.6	5,310
T. 125 N., R. 47 W., corner secs. 14, 15, 22, and 23, crossroads	45 37 45.1	96 33 07.9	5,306
T. 125 N., R. 47 W., corner secs. 13, 14, 23, and 24, crossroads	45 37 45.3	96 31 52.8	5,339

Magnetic declination for north border of quadrangle, 11° 40′ E.; for south border, 11° 29′ E.; for east border, 11° 21′ E.; for west border, 11° 30′ E.; for center, 10° 57′ E.

NEW EFFINGTON QUADRANGLE.

Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
NORTH DAKOTA.			
T. 129 N., R. 50 W., near corner secs. 17, 18, 19, and 20, 500 feet northwest of small white house, windmill, and barn, 70 feet east of north-south section line, and on east-west section line; iron post stamped "Prim. Trav. Sta. No. 3, 1915"	° ′ ″ 45 58 48.0	° ′ ″ 96 59 27.4	*Feet.*
T. 129 N., R. 50 W., corner secs. 7, 8, 17, and 18, crossroads	45 59 40.2	96 59 28.0	5,285
T. 129 N., R. 50 W., corner secs. 8, 9, 16, and 17, crossroads	45 59 39.9	96 58 14.4	5,200
T. 129 N., R. 50 W., corner secs. 9, 10, 15, and 16, crossroads	45 59 39.2	96 56 59.4	5,300
T. 129 N., R. 50 W., corner secs. 10, 11, 14, and 15, crossroads	45 59 38.7	96 55 43.8	5,340
T. 129 N., R. 50 W., corner secs. 11, 12, 13, and 14, crossroads	45 59 38.7	96 54 29.4	5,260
T. 129 N., Rs. 49 and 50 W., at corner secs. 7, 12, 13, and 18, 15 feet northwest to telephone pole, 50 feet southeast to telephone pole; iron post stamped "Prim. Trav. Sta. No. 4, 1915"	45 59 38.6	96 53 15.2	5,242
T. 129 N., R. 49 W., corner secs. 7, 8, 17, and 18, crossroads	45 59 38.4	96 52 00.6	5,269
T. 129 N., R. 49 W., corner secs. 8, 9, 16, and 17, crossroads	45 59 38.1	96 50 45.0	5,339
T. 129 N., R. 49 W., corner secs. 9, 10, 15, and 16, crossroads	45 59 37.9	96 49 30.6	5,257
T. 129 N., R. 49 W., corner secs. 10, 11, 14, and 15, crossroads	45 59 38.1	96 48 16.0	5,268
T. 129 N., R. 49 W., corner secs. 11, 12, 13, and 14, crossroads	45 59 36.7	96 47 01.9	5,240
T. 129 N., Rs. 48 and 49 W., 40 feet from corner secs. 7, 18, 12, and 13, at east end of row of cottonwood trees; iron post stamped "Prim. Trav. Sta. No. 5, 1915"	45 59 36.9	96 45 47.4	5,261
T. 129 N., Rs. 48 and 49 W., corner sections, crossroads	45 58 44.5	96 45 48.0	5,308
T. 129 N., Rs. 48 and 49 W., corner sections, T road north	45 57 52.9	96 45 48.2	5,221

Along highways through center of quadrangle.

SOUTH DAKOTA.			
T. 128 N., R. 49 W., corner secs. 13, 14, 23, and 24, T road south	45 51 48.7	96 45 02.9	
T. 128 N., R. 49 W., corner secs. 14, 15, 22, and 23, crossroads	45 51 48.4	96 46 16.9	5,238
T. 128 N., R. 49 W., corner secs. 15, 16, 21, and 22, crossroads	45 51 48.8	96 47 32.6	5,359
T. 128 N., R. 49 W., corner secs. 17, 18, 19, and 20, crossroads	45 51 48.4	96 50 02.6	10,615
T. 128 N., R. 49 W., corner secs. 18, 19, 13, and 24, crossroads	45 51 48.4	96 51 16.8	5,250
T. 128 N., R. 50 W., corner secs. 13, 14, 23, and 24, four corners	45 51 48.4	96 52 31.8	5,310
T. 128 N., R. 50 W., 1,770 feet east of corner of secs. 14, 15, 22, and 23, on north side of road, near white church; iron post stamped "Prim. Trav. Sta. No. 2, 1915"	45 51 48.4	96 53 22.0	3,550
T. 128 N., R. 50 W., corner secs. 15, 16, 21, and 22, crossroads	45 51 47.8	96 55 02.0	7,080
Effington, 0.30 mile west of, second class, T road north	45 51 21.8	96 55 39.5	3,743
T. 128 N., R. 50 W., corner secs. 20, 21, 28, and 29, four corners	45 50 55.4	96 56 16.5	3,744
T. 128 N., R. 50 W., corner secs. 19, 20, 29, and 30, crossroads	45 50 55.1	96 57 31.8	5,330
T. 128 N., Rs. 50 and 51 W., corner secs. 19, 24, 25, and 30, crossroads	45 50 55.4	96 58 45.0	5,180
T. 128 N., R. 51 W., corner secs. 23, 24, 25, and 26, crossroads	45 50 56.3	96 59 59.5	5,279

Along highways near south border of quadrangle.

T. 127 N., R. 49 W., corner secs. 23, 24, 25, and 26, crossroads	45 45 41.3	96 45 00.4	
T. 127 N., R. 49 W., corner secs. 22, 23, 26, and 27, crossroads	45 45 41.7	96 46 15.6	5,330
T. 127 N., R. 49 W., corner secs. 21, 22, 27, and 28, crossroads	45 45 41.7	96 47 30.6	5,320
T. 127 N., R. 49 W., corner secs. 20, 21, 28, and 29, crossroads	45 45 41.5	96 48 45.6	5,320
T. 127 N., R. 49 W., corner secs. 19, 20, 29, and 30, crossroads	45 45 41.5	96 50 00.6	5,320

Magnetic declination along north border of quadrangle, 12° 02′ E.; along south border, 11° 31′ E.; along east border, 10° 50′ E.; along west border, 11° 34′ E.; in center, 11° 25′ E.

PEEVER QUADRANGLE.

Along highways near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
SOUTH DAKOTA.	° ′ ″	° ′ ″	*Feet.*
T. 126 N., R. 51 W., corner secs. 11, 12, 13, and 14, crossroads	45 42 13.1	96 59 57.0	
T. 126 N., Rs. 50 and 51 W., corner secs. 7, 12, 13, and 18, crossroads	45 42 11.9	96 58 42.6	5,280
T. 126 N., Rs. 50 and 51 W., corner secs. 13, 18, 19, and 24, crossroads	45 41 20.1	96 58 41.8	5,257
T. 126 N., Rs. 50 and 51 W., corner secs. 19, 24, 25, and 30, T road north	45 40 28.0	96 58 41.2	5,282
T. 126 N., R. 51 W., corner secs. 23, 24, 25, and 26, T road south	45 40 28.5	96 59 56.1	5,317
T. 126 N., R. 51 W., corner secs. 25, 26, 35, and 36, crossroads	45 39 35.6	96 59 55.6	5,370
Tps. 125 and 126 N., R. 51 W., corner secs. 1, 2, 35, and 36, crossroads	45 38 42.9	96 59 55.1	5,340
T. 125 N., R. 51 W., corner secs. 1, 2, 11, and 12, crossroads	45 37 50.7	96 59 56.4	5,299
T. 125 N., R. 51 W., corner secs. 11, 12, 13, and 14	45 36 58.7	96 59 56.3	5,272
T. 125 N., R. 51 W., corner secs. 13, 14, 23, and 24	45 36 06.3	96 59 56.5	5,307
T. 125 N., R. 51 W., 1,008 feet south of corner secs. 13, 14, 23, and 24, on west side of north and south road; iron post stamped "Prim. Trav. Sta. No. 9, 1915"	45 35 56.4	96 59 56.7	1,008
T. 125 N., R. 51 W., corner secs. 23, 24, 25, and 26, crossroads	45 35 13.9	96 59 57.6	4,314
T. 125 N., R. 51 W., corner secs. 25, 26, 35, and 36, crossroads	45 34 21.0	96 59 58.7	5,360
T. 125 N., R. 51 W., quarter corner between secs. 35 and 36, T road west	45 33 55.3	96 59 59.4	2,610
Tps. 124 and 125 N., corner secs. 1, 2, 35, and 36, T road west	45 33 28.9	96 59 59.3	2,680
T. 124 N., R. 51 W., corner secs. 1, 2, 11, and 12, crossroads	45 32 37.7	96 59 58.6	5,190
T. 124 N., R. 51 W., corner secs. 11, 12, 13, and 14, T road north	45 31 45.4	96 59 58.3	5,310
T. 124 N., Rs. 50 and 51 W., corner secs. 7, 12, 13, and 18	45 31 44.7	96 58 45.0	5,218
T. 124 N., R. 50 W., corner secs. 13, 18, 19, and 24, crossroads	45 30 52.8	96 58 43.8	5,260
T. 124 N., R. 50 W., 15 feet north and 20 feet east of corner secs. 19, 30, 24, and 25, east side of north and south road and north of east and west road, 5 feet from corner of wire fence; iron post stamped "Prim. Trav. Sta. No. 10, 1915"	45 30 00.6	96 58 43.9	5,293

Along highways near south border of quadrangle.

T. 124 N., R. 50 W., corner secs. 19, 20, 29, and 30	45 30 00.6	96 57 29.8	5,280
T. 124 N., R. 50 W., corner secs. 20, 21, 28, and 29	45 30 00.9	96 56 15.1	5,319
Crossing of Sisseton Branch of the Chicago Milwaukee & St. Paul Ry.	45 30 00.6	96 55 52.1	1,639
Tps. 123 and 124 N., R. 50 W., corner secs. 21, 22, 28, and 3, crossroads	45 30 00.6	96 55 01.6	3,590
T. 124 N., R. 49 W., corner secs. 25, 30, 31, and 36, crossroads	45 30 51.0	96 51 41.1	
T. 124 N., R. 49 W., corner secs. 19, 24, 25, and 30, crossroads	45 31 44.0	96 51 41.4	5,360
T. 124 N., R. 49 W., corner secs. 13, 18, 19, and 24	45 32 36.0	96 51 41.2	5,260
Brown Valley Southeast Base triangulation station C. & G. S. (Roberts County, S. Dak., O. W. F. 1903; 1906), situated near the south side of sec. 18, T. 124 N., R. 49 W., on land belonging to Smith & Engebritzen, bankers, in Brown Valley, and rented to Sanford Allen. It is 4¼ miles south, 22° west from Brown Valley. It is marked by a deep cross cut in a ⅝-inch copper bolt set in the head of a stone block resting in a mass of concrete, its top level with the surface of the ground. The reference mark is in the section line, in azimuth 356° 44′ 13″ from the station; it is 1.49 meters lower in elevation than the station. The southeast corner of this section (18) is connected with the station. The following azimuths and distances are from the triangulation station: Windmill at Larson's house, 115° 55′ 08″, about 1 mile; Dittmann's red barn, south gable, 200° 25′ 22″, about 1,000 meters; Jim Bitner's house, chimney, 351° 46′ 30″, about 800 meters	45 32 38.72	96 50 48.02	3,793

Along highways through center of quadrangle.

T. 125 N., Rs. 50 and 51 W., corner secs. 7, 12, 13, and 18, crossroads	45 36 58.0	96 58 42.4	
T. 125 N., R. 50 W., corner secs. 7, 8, 17, and 18, crossroads	45 36 57.8	96 57 28.5	5,256
T. 125 N., R. 50 W., corner secs. 8, 9, 16, and 17, crossroads	45 36 58.0	96 56 13.1	5,360
T. 125 N., R. 50 W., corner secs. 9, 10, 15, and 16, 3 corners	45 36 57.7	96 54 59.2	5,250
T. 125 N., R. 50 W., iron and concrete bridge	45 36 53.9	96 54 31.1	2,040
T. 125 N., R. 50 W., corner secs. 10, 11, 14, and 15, crossroads	45 36 58.0	96 53 45.0	3,302
Brown Valley, 3 miles northwest of, 0.3 mile southwest of Mission Church; iron bridge	45 36 58.0	96 52 32.5	5,150
MINNESOTA.			
Brown Valley, in northwest part of elbow in road	45 35 53.7	96 50 55.5	
Brown Valley water tower triangulation station, U. S. C. & G. S., 1903	45 35 40.26	96 49 51.87	4,729
Brown Valley, 1.5 miles north of, elbow in road	45 36 54.5	96 50 01.1	7,548
T. 125 N., R. 49 W., corner secs. 21, 22, 27, and 28, crossroads	45 36 54.4	96 49 23.8	2,650
T. 125 N., R. 49 W., corner secs. 22, 23, 26, and 27, crossroads	45 36 54.5	96 48 08.7	5,340
T. 125 N., R. 49 W., corner secs. 23, 24, 25, and 26, crossroads	45 36 54.6	96 46 53.6	5,340
T. 125 N., R. 49 W., corner secs. 24, 25, 19, and 30, crossroads	45 36 54.6	96 45 38.9	5,310

Magnetic declination for north border of quadrangle, 11° 31′ E.; for south border, 11° 18′ E.; for east border, 11° 30′ E.; for west border, 10° 59′ E.; for center, 11° 02′ E.

PEEVER QUADRANGLE—Continued.

Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
SOUTH DAKOTA.			
	° ′ ″	° ′ ″	*Feet.*
T. 127 N., Rs. 49 and 50 W., corner secs. 30, 31, 25, and 36, second-class T road south	45 44 48.1	96 51 15.5	.....
T. 127 N., R. 50 W., 12 feet south and 35 feet west of corner of secs. 26, 27, 34, and 35, 4 feet northwest of telephone pole; iron post stamped "Prim. Trav. Sta. No. 7, 1915"	45 44 48.0	96 53 45.1	10,609
T. 127 N., R. 50 W., corner secs. 27, 28, 33, and 34, crossroads	45 44 47.3	96 54 59.5	5,283
T. 127 N., R. 50 W., corner secs. 28, 29, 32, and 33, crossroads	45 44 48.7	96 56 13.9	5,280
T. 127 N., R. 50 W., corner secs. 29, 30, 31, and 32, crossroads	45 44 48.8	96 57 28.4	5,290
T. 127 N., Rs. 50 and 51 W., corner secs. 30, 31, 25, and 36, crossroads	45 44 49.1	96 58 44.0	5,360
T. 127 N., R. 51 W. corner secs. 25, 26, 35, and 36, crossroads	45 44 49.0	96 59 57.7	5,230

Magnetic declination for north border of quadrangle, 11° 31′ E.

SISSETON QUADRANGLE.

Along highways near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
SOUTH DAKOTA.			
	° ′ ″	° ′ ″	*Feet.*
T. 128 N., R. 51 W., corner secs. 22, 23, 26, and 27, crossroads	45 50 55.4	97 01 14.5	.....
Harmer siding, about 0.40 mile south of, in sec. 23, T. 128 N., R. 51 W., very high steeple on church (U. S. C. & G. S. point)	45 51 00.69	97 01 16.35	555
Harmer siding, crossroads at	45 51 21.7	97 01 15.3	2,130
T. 128 N., R. 51 W., corner secs. 14, 15, 22, and 23, crossroads	45 51 48.3	97 01 15.7	2,690
T. 128 N., R. 51 W., corner secs. 10, 11, 14, and 15, T road west	45 52 41.7	97 01 15.4	5,410
T. 128 N., R. 51 W., corner secs. 2, 3, 10, and 11, crossroads	45 53 33.2	97 01 15.4	5,210
T. 128 N., R. 51 W., in sec. 2, white church steeple	45 53 44.3	97 01 14.1	1,132
T. 128 N., R. 51 W., north corner secs. 2 and 3, T road south	45 54 24.2	97 01 15.2	4,040
T. 129 N., R. 51 W., south side secs. 35 and 36, T road north	45 54 24.3	97 01 09.6	368
T. 129 N., R. 51 W., corner secs. 25, 26, 35, and 36, crossroads	45 55 16.8	97 01 09.6	5,320
T. 127 N., R. 51 W., 20 feet north and 20 feet west of crossroads at corner secs. 26, 27, 34, and 35; iron post stamped "Prim. Trav. Sta. No. 8, 1915"	45 44 49.2	97 01 13.0	.....
T. 127 N., R. 51 W., corner secs. 22, 23, 26, and 27, crossroads	45 45 41.2	97 01 14.1	5,268
T. 127 N., R. 51 W., corner secs. 14, 15, 22, and 23, crossroads	45 46 33.8	97 01 15.8	5,320
T. 127 N., R. 51 W., corner secs. 10, 11, 14, and 15, crossroads	45 47 26.1	97 01 16.2	5,299
T. 127 N., R. 51 W., corner secs. 2, 3, 10, and 11, crossroads	45 48 18.7	97 01 15.4	5,320
Tps. 127 and 128 N., R. 51 W., corner secs. 2, 3, 34, and 35, crossroads	45 49 10.2	97 01 14.5	5,220
T. 128 N., R. 51 W., corner secs. 26, 27, 34, and 35, crossroads	45 50 03.0	97 01 15.0	5,340

Magnetic declination for east border of north half of quadrangle, 11° 34′ E.

Along highways.

Prim. Trav. Sta. No. 8, 1915	45 44 49.17	97 01 13.04	.....
Tps. 126 and 127 N., R. 51 W., corner secs. 2, 3, 34, and 35, second-class crossroad	45 43 56.4	97 01 11.7	5,350
T. 126 N., R. 51 W., corner secs. 2, 3, 10, and 11, second-class cross-road	45 43 06.8	97 01 12.4	5,030
T. 126 N., R. 51 W., corner secs. 10, 11, 14, and 15, T road north	45 42 13.9	97 01 12.9	5,360

Along highways near east border of quadrangle.

T. 129 N., R. 51 W., corner secs. 23, 24, 25, and 26, crossroads on Stateline	45 56 09.4	97 01 09.1	.....
T. 129 N., R. 51 W., corner secs. 13, 14, 23, and 24, crossroads	45 57 02.1	97 01 09.0	5,340
T. 129 N., R. 51 W., corner secs. 11, 12, 13, and 14, T road south	45 57 53.7	97 01 08.9	5,230
Second-class road crossing	45 58 48.9	97 00 42.4	5,900

WHITE ROCK QUADRANGLE.

Along highways near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
MINNESOTA.			
T. 126 N., Rs. 46 and 47 W., 20 feet north and 15 feet east of north corner secs. 1 and 6, 2 feet from corner of fence; iron post stamped "Prim. Trav. Sta. No. 15, 1915"	° ′ ″ 45 45 34.8	° ′ ″ 96 30 38.0	*Feet.*
T. 126 N., R. 47 W., north corner secs. 1 and 2	45 45 34.8	96 31 52.8	5,300
T. 126 N., R. 47 W., north corner secs. 2 and 3, T road south	45 45 34.8	96 33 07.2	5,280

Magnetic declination for south border of quadrangle, 11° 40′ E.

MARVIN QUADRANGLE.

Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
SOUTH DAKOTA.			
Tps. 123 and 124 N., R. 50 E., corner secs. 2, 3, 22, and 35, crossroads	° ′ ″ 45 29 59.7	° ′ ″ 96 54 11.0	*Feet.*
Tps. 123 and 124 N., R. 50 E., corner secs. 1, 2, 35, and 36, crossroads	45 29 59.8	96 52 55.4	5,380
Tps. 123 and 124 N., R. 49 and 50 W., corner secs. 1, 6, 31, and 36, crossroads	45 29 59.5	96 51 41.3	5,280

Magnetic declination for north border of quadrangle, 11° 18′ E.

WHITE ROCK QUADRANGLE.

Along highways near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
NORTH DAKOTA.			
T. 129 N., Rs. 48 and 49 W., corner sections, 250 feet southwest of schoolhouse, four corners	° ′ ″ 45 57 53.6	° ′ ″ 96 44 33.1	*Feet.*
T. 129 N., Rs. 48 and 49 W., corner sections T road north at	45 57 01.5	96 44 33.7	5,270
T. 129 N., R. 49 W., corner sections, 30 feet northeast to letter box, four corners at	45 57 01.7	96 43 19.2	5,270
State line, 3 feet northwest of 12-inch stone post, 2.5 feet above ground, marked "N. D." on north side and "S. D." on south side; iron post stamped "Prim. Trav. Sta. No. 5, 1915"	45 56 09.7	96 43 19.4	5,266
SOUTH DAKOTA.			
T road south	45 55 17.9	96 43 36.6	
T road north, jog in road to west	45 54 25.1	96 43 36.4	5,349
T road south, at north corner secs. 1 and 6	45 54 25.1	96 43 47.2	760
T. 128 N., Rs. 48 and 49 W., corner secs. 1, 6, 7, and 12, crossroads	45 53 34.2	96 43 47.4	5,160
T. 128 N., Rs. 48 and 49 W., corner secs. 7, 12, 13, and 18, T road west	45 52 41.6	96 43 47.4	5,330
Rosholt, east end of Main Street, 3 feet north of telephone pole, 80 feet southeast of blacksmith shop; iron post stamped "Prim. Trav. Sta. No. 1, 1915"	45 52 00.4	96 43 47.7	4,170
T. 128 N., Rs. 48 and 49 W., corner secs. 18, 19, 24, and 13, four corners	45 51 49.3	96 43 47.4	1,125
T. 128 N., Rs. 48 and 49 W., corner secs. 19, 30, 24, and 25, four corners	45 50 56.7	96 43 47.5	5,330
T 128 N., Rs. 48 and 49 W., corner secs. 30, 31, 25, and 36, four corners	45 50 04.2	96 43 47.4	5,320
Enwiller triangulation station, U. S. C. & G. S., T. 128 N., R. 49 W., near the east side of NE. ¼ sec. 36, in Victor Township, Sisseton Indian Reservation, about 0.25 mile due south of the northeast corner of sec. 36, on land belonging to Harry Enwiller; 2 miles east and 1.25 miles south of Crawford post office, on a prominent east and west ridge, 13 paces west from center of wagon road where it crosses the ridge, 4.39 meters east of fence line on east side of sec. 36; iron pipe filled with concrete and 60-penny nail in top	45 49 51.92	96 43 47.86	1,239
T corner and crossroads	45 49 11.9	96 43 47.2	4,060
T. 127 N., R. 48 W., at southwest quarter corner of sec. 6, 10 feet west of road; iron bench-mark post stamped "El. 1078"	45 48 45.6	96 43 47.4	2,670
T. 127 N., R. 49 W., corner secs. 1, 6, 7, and 12, crossroads	45 48 19.3	96 43 47.0	2,660
T. 127 N., R. 49 W., corner secs. 7, 18, 12, and 13, crossroads	45 47 26.8	96 43 46.8	5,330
T. 127 N., R. 49 W., corner secs. 18, 19, 13, and 24, crossroads	45 46 34.2	96 43 46.3	5,330
T. 127 N., R. 49 W., 20 feet south and 15 feet east of corner of secs. 19, 30, 24, and 25, at northwest corner of grove; iron post stamped "Prim. Trav. Sta. No. 6, 1915"	45 45 41.4	96 43 45.7	5,353

Magnetic declination for west border of quadrangle, 10° 50′ E.

INDIANA.

PRIMARY TRAVERSE.

Birds, Merom, Montuers Pond, Oaktown, and Vincennes quadrangles.

SULLIVAN AND KNOX COUNTIES.

The following geographic positions on North American datum were determined from primary traverse run by C. B. Kendall in 1913. The line begins with position of Merom triangulation. United States Coast and Geodetic Survey, and follows public roads east and south via Busseron to Vincennes, where it is tied to United States Coast and Geodetic Survey astronomic station, Vincennes, The line is also tied to the United States Corps of Engineers' traverse line along the Wabash River at Riverton and Vincennes.

BIRDS QUADRANGLE.

Along public roads.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Four corners, public crossroads (dup.)	39 00 45.3	87 31 20.6	.....
Tps. 6 and 7 N., R. 10 W., corner secs. 3, 4, 33, and 34, ¼ mile west of; public T road north, second-class road west	38 59 53.6	87 31 21.2	5,231
T. 6 N., R. 10 W. (north) corner secs. 3 and 4, center of east and west road in line with two elm trees in field to south and the east edge of Jonesville schoolhouse on north	38 59 53.3	87 31 07.8	1,060
NOTE.—250 feet east of the above is T. 7 N., R. 10 W., south corner secs. 33 and 34.			
T. 6 N., R. 10 W., north corner secs. 3 and 4, 710 feet east of; 15 feet south and 20 feet west of center of public T roads, 720 feet east of Jonesville schoolhouse, inside of wire fences; iron post stamped "Prim. Trav. Sta. No. 1, 1913, Indiana"	38 59 53.0	87 30 58.9	700
Jonesville schoolhouse, 1½ mile south of, public T road south, 15 feet south to center of triangle, 35 feet northwest to sycamore, center sec. 10, T. 6 N., R. 10 W.	38 58 46.0	87 30 37.9	6,972
T. 6 N., R. 10 W., quarter corner between secs. 10 and 15, public T road south, 150 feet east of public T road north	38 58 21.2	87 30 34.6	2,532
T. 6 N., R. 10 W., quarter corner between secs. 15 and 22, public T road north	38 57 28.5	87 30 34.5	5,325
T. 6 N., R. 10 W., corner secs. 14, 15, 22, and 23, center of east-west road at wire fence south	38 57 28.3	87 30 00.7	2,670

Magnetic declination for east border of quadrangle, 3° 03′ E.

MEROM QUADRANGLE.

Along public roads.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Merom triangulation station, U. S. C. & G. S.	39 03 02.71	87 33 53.02	.....
Riverton, U. S. Engineers iron bench mark No. 32, described as follows: "Riverton, 150 feet back from river, on left bank, 600 feet below east abutment of Illinois Central R. R. drawbridge, on east slope of levee, on land of P. H. Blue, 35 feet northeast of Houseboat shack outside of levee, residence of Richard Meek, 50 feet southeast of houseboat shack outside of levee, residence of Arthur Meet; iron pipe (U. S. C. E. b. m. No. 32)"	39 01 07.99	87 34 04.55	11,644

MEROM QUADRANGLE—Continued.

Along public roads—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Riverton, 1 mile east of, public T road west, center of north and south road at	39 01 17.2	87 33 01.2	5,084
T. 7 N., R. 10 W., quarter corner between secs. 28 and 29	39 01 12.2	87 32 10.9	4,007
T. 7 N., R. 10 W., quarter corner between secs. 28 and 29, 1,200 feet east of; public T road west, 140 feet west of 90° bend of road to south	39 01 12.0	87 31 55.9	1,180
T. 7 N., R. 10 W., corner secs. 28, 29, 32, and 33, ¼ mile east of; public T road north	39 00 45.8	87 31 54.0	2,647
NOTE.—1,320 feet west of the above is T. 7 N., R. 10 W., corner secs. 28, 29, 32, and 33 at cross fences.			
Four corners, public crossroads	39 00 45.3	87 31 20.6	2,604
NOTE.—1,310 feet east of the above is T. 7 N., R. 10 W., corner secs. 27, 28, 33, and 34.			

Magnetic declination for south border of quadrangle, 3° 07′ E.

MONTUERS POND QUADRANGLE.

Along public roads.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Oak schoolhouse, 1½ miles southwest of, three-corner public T road northeast, center of triangle at, 20 feet east to mail box No. 44, on fence post, 25 feet north to corner fence post	38 44 36.7	87 28 15.4	.....
Ellis schoolhouse, 500 feet southwest of, on the southeast edge of the Vincennes-Terre Haute public road, 30 feet south and 10 feet west of center of public T road southeast, 10 feet west of large corner post of wire fence and 15 feet east of a large elm tree; iron post stamped "Prim. Trav. Sta. No. 3, 1913, Indiana"	38 44 12.1	87 28 13.3	2,496
Ellis schoolhouse, 1 mile southwest of; second class T road southeast, 15 feet east to telephone pole, 20 feet south to corner of fence	38 43 40.6	87 29 09.8	5,489
Bridge over Snaps Creek, $\frac{5}{16}$ mile north of, four-cornered public crossroad, center of pike at	38 42 50.9	87 29 41.8	5,632
Snaps Creek, bridge, 500 feet north of; public roads north and northeast, 12 feet east to telephone pole	38. 42. 08. 5	87 29 53.2	4,389

Magnetic declination for northwest border of quadrangle, 3° 04′ E.

OAKTOWN QUADRANGLE.

Along public roads.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 6 N., R. 10 W., corner secs. 13, 14, 23, and 24, public T road south.	38 57 27.9	87 28 52.3	.....
T. 6 N., R. 10 W., corner secs. 23, 24, 25, and 26, second-class crossroad	38 56 34.6	87 28 52.7	5,400
Busseron Creek, center of iron bridge over	38 55 56.9	87 28 52.6	3,805
T. 6 N., R. 10 W., corner secs. 25, 26, 35, and 36, center of north-south road at fences east and west, 70 feet south of T road west	38 55 41.2	87 28 52.6	1,590
T. 6 N., R. 10 W., corner secs. 25, 26, 35, and 36, ¼ mile south of; public crossroads	38 55 27.7	87 28 52.5	1,370
T. 6 N., R. 10 W., (south) corner secs. 35 and 36, public T road north (120 feet east of the above may be T. 5 N., R. 10 W., stone north corner of secs. 1 and 2)	38 54 47.8	87 28 52.4	4,030
Three-corners, public T road north	38 53 22.8	87 28 48.5	8,608
Oaktown, about 1 mile north and 1½ miles west of; three-corners public T road south, 20 feet south to center of triangle	38 53 24.3	87 28 19.0	2,336
Oaktown, ½ mile north and 1½ miles west of, in sec. 13, T. 5 N., R. 10 W., on west edge of north-south road opposite and in line with center of public T road east to Oaktown; iron post stamped "Prim. Trav. Sta. No. 2, 1913, Indiana"	38 52 30.7	87 28 20.1	5,422

OAKTOWN QUADRANGLE—Continued.

Along public roads—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Oaktown, about 2½ miles west of; forks, public roads west and northwest, 12 feet south to corner wire fence	38 51 34.7	87 28 17.6	5,666
Oaktown, about 2 miles southwest of; four-corners public cross-roads	38 50 55.4	87 27 31.3	5,406
Busseron station, 75 feet southwest of; public road crossing Chicago & Eastern Illinois R. R., center of main track at	38 50 09.0	87 26 59.1	5,347
Busseron station, 1 7/10 miles southeast of; forks public roads west and southwest, 15 feet southwest to center of triangle	38 48 40.3	87 26 35.6	9,159
Briar Creek Bridge, ¼ mile northwest of; large sycamore tree at public T road west to Emison	38 47 54.9	87 26 31.8	4,605
Briar Creek, center of iron bridge over	38 47 42.2	87 26 22.1	1,496
Briar Creek, center of iron bridge over, 1,000 feet south of; forks, public roads south and southwest 30 feet north to telephone pole, 75 feet southwest to telephone pole and sign "Vincennes 12 miles"	38 47 33.1	87 26 21.6	923
Briar Creek Bridge, 1 mile southwest of, second-class fork southeast; large elm tree in center of triangle at	38 46 59.8	87 27 01.3	4,609
Oak schoolhouse, 1/10 mile northeast of; three-corners public T road southeast, 10 feet southeast to center of triangle, 18 feet northwest to telephone pole and mail box	38 46 16.9	87 27 20.6	4,610
Oak schoolhouse, at forks northeast and north; chimney in center of house	38 45 50.7	87 27 53.1	3,690
Oak schoolhouse, ¾ mile southwest of; center of bridge over Small's creek	38 45 15.2	87 28 09.7	3,825

Magnetic declination for west border of quadrangle, 3° 03′ E.

VINCENNES QUADRANGLE.

Along public road and streets in Vincennes.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Snaps Creek Bridge, 4/10 mile southwest of, Vincennes, 1½ miles northeast of; Vincennes-Terre Haute public road crossing the Chicago & Eastern Illinois R. R., center of track at	38 41 57.5	87 30 13.6	.....
Vincennes, about 1 mile northeast of; four-corners near east end of bridge over Kelsaw Creek	38 41 54.3	87 30 34.9	1,721
Vincennes, First Street and Lyndale Avenue, center of intersection of	38 41 21.5	87 30 54.6	3,666
Vincennes, Baltimore & Ohio R. R. crossing First Street, center of main track at	38 41 04.2	87 31 32.3	3,465
Vincennes, U. S. Coast and Geodetic Survey astronomic station	38 40 35.70	87 31 35.05	2,888

Magnetic declination for northeast border, 3° 14′ E.

Farmland, Fort Recovery, Lynn, and Redkey quadrangles.

RANDOLPH AND WAYNE COUNTIES.

The following geographic positions on North American datum were determined by J. H. Wilson in 1915 and are based on primary traverse positions, on and near the Indiana-Ohio State line, determined in 1910.

FARMLAND QUADRANGLE.

Along highways near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 21 N., Rs. 13 and 14 E., corner of secs. 25, 36, 30, and 31, cross-roads 0.5 mile west of Clarke	40 14 12.2	85 00 59.2	.....
Tps. 20 and 21 N., Rs. 13 and 14 E., corner of; crossroads	40 13 20.0	85 00 58.7	5,280
Bethel M. E. Church, T road east, west corner of secs. 6 and 7 (300 feet south of above corner is T. 20 N., R. 13 E., east corner of secs. 1 and 12, T road west.)	40 12 31.1	85 00 58.4	4,950

FARMLAND QUADRANGLE—Continued.

Along highways near east border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 20 N., R. 13 E., east corner of secs. 12 and 13, T road west	40 11 36.2	85 00 58.2	5,560
White River, north end of bridge over	40 10 55.5	85 00 58.1	4,120
T. 20 N., R. 14 E., west corner of secs. 18 and 19, 130 feet north of Big Four R. R. crossing	40 10 44.8	85 00 58.1	1,080
Lykins station on traction line, crossroads 1.5 miles west of Winchester	40 10 19.3	85 00 58.0	2,580
T. 20 N., R. 14 E., west corner of secs. 19 and 30, fence east (65 feet south of above corner is T. 20 N., R. 13 E., east corner of secs. 24 and 25.)	40 09 52.8	85 00 57.9	2,680
T. 20 N., R. 13 E., east corner of secs. 25 and 36, fence west	40 09 00.3	85 00 57.4	5,315
Tps. 19 and 20 N., Rs. 13 and 14 E., corner of, right angle bend in road	40 08 08.3	85 00 57.2	5,260
T. 19 N., R. 13 E., west corner of secs. 1 and 12, 5 feet north and 15 feet east of, and T. 19 N., R. 14 E., east corner of secs. 6 and 7, 155 feet south and 15 feet east of, on east side of north and south road at T road west; iron post stamped "Prim. Trav. Sta. No. 2, 1915"	40 07 16.4	85 00 56.8	5,259
T. 19 N., R. 14 E., west corner of secs. 7 and 18, T road east (175 feet south of above corner is T. 19 N., R. 13 E., east corner of secs. 12 and 13, T road west.)	40 06 26.0	85 00 56.6	5,100
T. 19 N., R. 14 E., west corner of secs. 18 and 19, T road east (95 feet south of above corner is T. 19 N., R. 14 E., east corner of secs. 13 and 24, T road west.)	40 05 33.1	85 00 56.3	5,355
T. 19 N., R. 14 E., west corner of secs. 19 and 30, T road east (80 feet south of above corner is T. 19 N., R. 13 E., east corner of secs. 24 and 25, T road west.)	40 04 40.7	85 00 56.1	5,295
T. 19 N., R. 14 E., west corner of secs. 30 and 31, T road east (190 feet south of above corner is T. 19 N., R. 13 E., east corner of secs. 25 and 36, T road west.)	40 03 49.8	85 00 55.9	5,160
Tps. 18 and 19 N., Rs. 13 and 14 E., corner of, T road north	40 02 55.8	85 00 55.8	5,456
T. 18 N., R. 13 E., stone quarter corner between secs. 1 and 12, T road west	40 02 03.5	85 01 29.5	5,914
T. 18 N., Rs. 13 and 14 E., quarter corner between secs. 7 and 12, T road south	40 01 37.4	85 00 55.5	3,738
T. 18 N., Rs. 13 and 14 E., corner of secs. 12, 13, 7, and 18, crossroads	40 01 11.4	85 00 55.5	2,630
T. 18 N., Rs. 13 and 14 E., corner of secs. 13, 24, 18, and 19, 15 feet north and 18 feet west of, at northwest corner of crossroads on Randolph-Wayne County line; iron post stamped "Prim. Trav. Sta. No. 4, 1915"	40 00 19.3	85 00 55.6	5,274

Magnetic declination for east border of quadrangle, 0° 45′ E.

FORT RECOVERY QUADRANGLE.

Along highways near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 21 N., R. 15 E., corner of secs. 14, 15, 22, and 23, T road west at abandoned schoolhouse	40 15 59.2	84 49 26.6	.....
T. 21 N., R. 15 E., corner of secs. 15, 16, 21, and 22, crossroads 0.5 mile east of Jackson school	40 15 59.6	84 50 34.8	5,283
T. 21 N., R. 15 E., corner of secs. 16, 17, 20, and 21, crossroads 0.5 mile west of Jackson school	40 15 57.6	84 51 43.0	5,290
T. 21 N., R. 15 E., corner of secs. 17, 18, 19, and 20, crossroads at abandoned schoolhouse	40 15 59.3	84 52 51.9	5,350
T. 21 N., Rs. 14 and 15 E., corner of secs. 13, 24, 18, and 19, crossroads	40 15 58.4	84 54 00.7	5,330
T. 21 N., R. 14 E., corner of secs. 13, 14, 23, and 24, T road east at abandoned schoolhouse	40 15 58.3	84 55 08.7	5,270
T. 21 N., R. and E., corner of secs. 14, 15, 22, and 23, center of north and south road, 150 feet north of crossroads	40 15 59.1	84 56 16.4	5,251
T. 21 N., R. 14 E., corner of secs. 15, 16, 21, and 22, crossroads just south of abandoned schoolhouse	40 15 58.4	84 57 25.1	5,322
Randolph, railroad crossing, north track, 90 feet north of corner of secs. 16, 17, 20, and 21, T. 21 N., R. 14 E	40 15 58.8	84 58 33.6	5,314
T. 21 N., R. 14 E., quarter corner between secs. 20 and 21, crossroads	40 15 31.8	84 58 33.6	2,725
T. 21 N., R. 14 E., quarter corner between secs. 19 and 20, crossroads	40 15 31.1	84 59 42.1	5,310

Magnetic declination for south border of quadrangle, 1° E.

LYNN QUADRANGLE.

Along Randolph-Wayne county line near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 18 N., R. 14 E., corner of secs. 17, 18, 19, and 20, crossroads	40 00 19.8	84 59 47.0	.....
T. 18 N., R. 14 E., corner of secs. 16, 17, 20, and 21, crossroads	40 00 19.6	84 58 39.1	5,280
T. 18 N., R. 14 E., stone corner of secs. 15, 16, 21, and 22, crossroads	40 00 20.0	84 57 30.8	5,320
Lynn, 3 miles south of, crossroads, corner of secs. 14, 15, 22, and 23, T. 18 N., R. 14 E	40 00 20.2	84 56 22.5	5,310
T. 18 N., R. 14 E., corner of secs. 13, 14, 23, and 24, center of east and west road at fence north	40 00 20.1	84 55 14.1	5,320
T. 18 N., R. 14 E., east corner of secs. 13 and 14, on line with telephone line west	40 00 19.8	84 54 08.1	5,139
(160 feet north of above corner is T. 18 N., R. 15 E., west corner of secs. 18 and 19, fence corner in line with telephone line east.)			
T. 18 N., R. 15 E., east corner of fractional secs. 18 and 19, center of road on Greenville treaty line at telephone line west	40 00 20.5	84 53 34.3	2,629
Tps. 10 and 11 N., R. 1 W., west corner of fractional secs. 5 and 32, T road east on county line	40 00 23.8	84 53 33.4	342
Tps. 10 and 11 N., R. 1 W., corner of secs. 4, 5, 32, and 33, fence south	40 00 23.6	84 53 10.2	1,807
T. 11 N., R. 1 W., south corner of secs. 33 and 34, 30 feet west of crossroads just south of Arba	40 00 22.6	84 52 01.0	5,380
(65 feet east of above corner is T. 10 N., R. 1 W., north corner of secs. 3 and 4, 35 feet east of crossroads.)			
Tps. 10 and 11 N., R. 1 W., corner of secs. 2, 3, 34, and 35, T road south	40 00 21.6	84 50 52.6	5,320
T. 10 N., R. 1 W., north corner of secs. 1 and 2, in line with road south	40 00 20.5	84 49 46.6	5,140
(30 feet east of above corner is T. 11 N., R. 1 W., south corner of secs. 35 and 36, in line with road north.)			
Tps. 10 and 11 N., Rs. 1 E. and 1 W., corner of, Ohio-Indiana State line, at east corner of Randolph and Wayne counties, Ind	40 00 19.3	84 48 37.9	5,350
Prim. Trav. Sta. No. 10, 1910, Ohio (Bulletin 552)	40 01 11.4	84 47 51.9	6,373

Along highways through center of quadrangle.

T. 19 N., R. 14 E., corner of secs. 5, 6, 7, and 8, center of east and west road at fence south	40 07 17.4	84 59 39.8	.....
Crossroads	40 07 17.2	84 59 14.7	1,955
T. 19 N., R. 14 E., corner of secs. 4, 5, 8, and 9, crossroads 1,620 feet west of Grand Rapids & Indiana R. R. crossing	40 07 16.2	84 58 32.5	3,275
T. 19 N., R. 14 E., corner of secs. 3, 4, 9, and 10, T road south, 50 feet west of crossroads	40 07 17.2	84 57 25.2	5,230
T. 19 N., R. 14 E., corner of secs. 2, 3, 10, and 11, T road south	40 07 16.5	84 56 18.0	5,219
T. 19 N., R. 14 E., corner of secs. 1, 2, 11, and 12, crossroads	40 07 14.9	84 55 10.4	5,260
T. 19 N., Rs. 14 and 15 E., corner of secs. 1, 12, 6, and 7, crossroads	40 07 16.7	84 54 05.1	5,075
Tps. 19 and 20 N., Rs. 14 and 15 E., 20 feet west and 570 feet south of, at northwest corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 3, 1915"	40 08 03.2	84 54 05.1	4,710
T. 19 N., R. 15 E., line between secs. 5 and 6, crossroads at abandoned schoolhouse	40 07 36.0	84 52 57.6	5,918
T. 19 N., R. 15 E., fence west on line between secs. 5 and 8, 60 feet northwest of road south	40 07 17.0	84 52 07.6	4,340
Crossroads on old Ohio-Indiana boundary line; line between sec. 9, T. 19 N., R. 15 E., and sec. 27, T. 12 N., R. 1 W	40 07 05.7	84 51 38.5	2,531
Bartonia; crossroads	40 06 56.0	84 51 02.7	2,946
T. 12 N., R. 1 W., line between secs. 22 and 27, east and west fence line at bend in road	40 07 21.2	84 51 02.2	2,551
T. 12 N., R. 1 W., quarter corner between secs. 22 and 23, center of east and west road at north and south fence line, 440 feet east of road east	40 07 47.0	84 50 43.0	3,012
T. 12 N., R. 1 W., quarter corner between secs. 23 and 24, crossroads at abandoned schoolhouse	40 07 46.4	84 49 35.9	5,210
T. 12 N., R. 1 W., east quarter corner of sec. 24, road west 25 feet north road east, State line	40 07 45.8	84 48 27.4	5,320
T. 12 N., R. 1 W., east corner of secs. 13 and 24	40 08 12.0	84 48 26.7	2,650
Prim. Trav. Sta. No. 41, 1910, Ohio (Bulletin 552)	40 09 04.8	84 48 25.0	5,343

Near north border of quadrangle.

T road east, just north of church and cemetery	40 14 46.5	84 49 26.7	.....

Magnetic declination for north border of quadrangle, 1° E.; for west border, 1° E.; for south border, 1½° E.; through center, 1¼° E.

POLITECHNIKA GDAŃSKA ZAKŁAD GEOLOGII

REDKEY QUADRANGLE.

Near southeast corner of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 21 N., R. 14 E., quarter corner, west side of sec. 19, 5 feet north and 15 feet west of, on west side of north and south road at T road east, 590 feet north of Grand Rapids & Indiana Railroad crossing; iron post stamped "Prim. Trav. Sta. No. 1, 1915"	40 15 30.4	85 01 00.1	.....
T. 21 N., R. 14 E., west corner of secs. 19 and 30, crossroads	40 15 04.2	85 00 59.7	2,650
(25 feet south of above corner is T. 21 N., R. 13 E., east corner of secs. 24 and 25.)			

ARMY COAST SURVEY

MICHIGAN AND INDIANA.

PRIMARY TRAVERSE.

Jones, Leonidas, Schoolcraft, Sturgis, and Three Rivers quadrangles, Mich.; Shipshewana quadrangle, Ind.

ST. JOSEPH COUNTY, MICH.; ELKHART AND LAGRANGE COUNTIES, IND.

The following geographic positions on North American datum were determined by primary traverse run in 1913 by J. H. Wilson and are based on positions located in west part of Three Rivers quadrangle in 1911, described in Bulletin 551, from Porter triangulation station, United States Lake Survey, and were tied to Sherman triangulation station of latter survey.

JONES QUADRANGLE.

South along highways near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Mottville, south end of bridge over St. Joseph River	41 48 00.0	85 45 18.3	
T. 8 S., R. 12 W., quarter corner between secs. 6 and 7, center of north and south road	41 47 40.1	85 45 00.6	2,424
T. 8 S., R. 12 W., quarter corner between secs. 7 and 81, center of north and south road, 30 feet south of road west and 30 feet south of road west and 30 feet north of bridge over White Pigeon River	41 46 47.6	85 45 00.8	5,310
T. 8 S., R. 12 W., quarter corner between secs. 18 and 19, crossroads at church	41 45 55.0	85 45 01.0	5,320
Vistula, about 0.5 mile north and 1 mile west of; iron bench mark post set at southeast corner of crossroads, 40 feet south and 15 feet east of quarter corner, south side of sec. 19, T. 8 S., R. 12 W. (This corner is on the State line which is the north edge of the east and west road); post stamped "Prim. Trav. Sta. No. 20, 1913"	41 45 32.3	85 45 00.8	2,305

Magnetic declination for east border of quadrangle, 0° 33′ E.

STURGIS QUADRANGLE.

North along highways near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 8 S., R. 10 W., corner of secs. 8, 9, 16, 17, crossroads	41 46 50.9	85 29 11.2	
Sturgis, 3.5 mile west of, crossroads 700 feet south of railroad crossing	41 47 39.9	85 29 11.6	4,960
Ts. 7 and 8 S., R. 10 W., stone corner of sections 32, 33, 4, and 5, crossroads at schoolhouse	41 48 35.8	85 29 11.8	5.665
T. 7 S., R. 10 W., south corner (stone) of sections 33 and 34, crossroads	41 48 36.4	85 28 01.8	5,300
T. 7 S., R. 10 W., corner of secs. 21, 22, 27, and 28, 20 feet west of center of crossroads	41 50 20.8	85 28 03.0	10,570
T. 7 S., R. 10 W., stone quarter corner between secs. 22 and 27, T road south	41 50 21.2	85 27 28.0	2,650
Sherman triangulation station of the Lake Survey, in northeast quarter sec. 22, T. 7 S., R. 10 W., about 4 miles northwest from Sturgis. A stone post below surface, with another one directly over it as a surface mark	41 50 48.5	85 27 11.7	3,028
T. 7 S., R. 10 W., corner of sections 15, 16, 21, and 22, crossroads	41 51 13.3	85 28 03.8	4,680
T. 7 S., R. 10 W., corner of sections 16, 17, 20, and 21, crossroads	41 51 12.8	85 29 13.8	5,300
T. 6 S., R. 10 W., quarter corner between secs. 28 and 29, crossroads	41 55 08.2	85 29 15.4	
T. 6 S., R. 10 W., corner of secs. 20, 21, 28, 29, crossroads at schoolhouse	41 55 34.3	85 29 15.8	2,650
T. 6 S., R. 10 W., corner of secs. 16, 17, 20, and 21, 25 feet north of center of T road east	41 56 26.9	85 29 16.4	5,320
T. 6 S., R. 10 W., corner of secs. 8, 9, 16, and 17, T road south	41 57 19.4	85 29 17.1	5,330
East and west section line, center of east and west road at crossroads, in line with road north	41 58 12.1	85 28 50.7	5,688
East and west township line, center of road at road south	41 59 04.1	85 28 37.8	5,350
St. Joseph River, north end of bridge over	41 59 07.2	85 28 52.0	1,119
T. 5 S., R. 10 W., corner of secs. 28, 29, 32, and 33, T road west	41 59 56.3	85 29 17.8	5,341

Magnetic declination for west border of quadrangle, 0° 7′ E.

LEONIDAS QUADRANGLE.

Near southwest corner of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Mendon, 1.5 miles west of, north side of east and west road at T road south, 25 feet north of quarter corner between secs. 28 and 29, T. 5 S., R. 10 W.; iron post stamped "Prim. Trav. Sta. No. 24, 1913, Mich."	42 00 22.7	85 29 18.0	.....

SCHOOLCRAFT QUADRANGLE.

West along highways near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 5 S., R. 10 W., quarter corner between secs. 29 and 30, T road south	42 00 22.0	85 30 28.4	.....
T. 5 S., R. 10 W., quarter corner, west side of section 30 (5 feet south of above corner is T. 5 S., R. 11 W., quarter corner east side of sec. 25)	42 00 21.6	85 31 41.9	.....
T. 5 S., R. 11 W., quarter corner between secs. 25 and 26, T road east	42 00 21.2	85 32 51.8	5,280
Parkville, crossroads at south edge of, corner of secs. 23, 24, 25, and 26, T. 5 S., R. 11 W	42 00 47.6	85 32 52.0	2,670
T. 5 S., R. 11 W., corner of secs. 22, 23, 26, and 27, crossroads	42 00 47.0	85 34 02.0	5,282
T. 5 S., R. 11 W., corner of secs. 21, 22, 27, and 28, crossroads at schoolhouse	42 00 46.7	85 35 12.7	5,340
T. 5 S., R. 11 W., corner of secs. 20, 21, 28, and 29, center of east and west road	42 00 46.8	85 36 22.5	5,270
Moore Park, 1 mile east of, at southwest corner of crossroads, 20 feet south and 45 feet west of quarter corner between secs. 20, 29, T. 5 S., R. 11 W.; iron post stamped "Prim. Trav. Sta. No 25, 1913, Mich."	42 00 46.4	85 36 58.4	2,712
T. 5 S., R. 11 W., corner of secs. 19, 20, 29, and 30; center of east and west road	42 00 46.5	85 37 32.8	2,600
Moore Park, railroad at east and west road crossing just south of depot	42 00 46.4	85 37 59.3	2,000
Moore Park, quarter corner in center of sec. 30, T. 5 S., R. 11 W., T road west	42 00 20.2	85 38 07.7	2,721
Rocky River, south end of bridge over	42 00 19.8	85 38 48.1	3,050
T. 5 S., R. 12 W., quarter corner between secs. 25 and 26, crossroads	42 00 20.1	85 39 51.1	4,758
T. 5 S., R. 12 W., quarter corner between secs. 26 and 27, crossroads	42 00 19.7	85 41 01.4	5,310
T. 5 S., R. 12 W., quarter corner between secs. 27 and 28, T road east	42 00 19.3	85 42 11.2	5,270

Magnetic declination for south border of quadrangle, 0° 16′ E.

SHIPSHEWANA QUADRANGLE.

East along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Vistula, center of north and south road at railroad crossing	41 44 59.2	85 43 40.6	.....
T. 38 N., R. 8 E., quarter corner between secs. 16 and 17, crossroads at schoolhouse	41 44 53.0	85 37 17.7	.....
T. 38 N., R. 8 E., quarter corner between secs. 15 and 16, crossroads	41 44 54.0	85 36 07.1	5,348
T. 38 N., R. 8 E., quarter corner between secs. 14 and 15, crossroads	41 44 55.0	85 34 57.4	5,288
White Pigeon River, west end of bridge over	41 44 54.7	85 34 35.4	1,666
Scott, four corners, church on northwest corner	41 44 30.1	85 33 23.4	6,005
T. 38 N., Rs. 8 and 9 E., corner of secs. 13, 24, 18, and 19, T road north ½ mile east of Scott	41 44 29.9	85 32 35.8	3,609
T. 38 N., R. 9 E., stone corner of secs. 17, 18, 19, and 20, 15 feet north of center of east and west road	41 44 31.1	85 31 28.8	5,079
Evangelical Church, 200 feet north of, center of crossroads	41 44 29.8	85 30 53.6	2,674
T. 38 N., R. 9 E., corner of secs. 16, 17, 20, 21, center of east and west road	41 44 33.5	85 30 18.8	2,667

Magnetic declination for north border of quadrangle, 0° 19′ E.

THREE RIVERS QUADRANGLE.

East along highways near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 8 S., R. 12 W., south corner of secs. 19 and 20, north edge of east and west road along Michigan-Indiana State line	41 45 32.5	85 44 26.1	.....
T. 38 N., R. 7 E., north corner of secs. 8 and 9 (Indiana data), 15 feet north of T road south	41 45 32.5	85 44 16.6	720
T. 38 N., R. 7 E., quarter corner, north side of sec. 9, State line, 20 feet north of center of crossroads	41 45 32.5	85 43 41.4	2,670
T. 8 S., R. 12 W., corner of secs. 13, 14, 23, and 24, T road west	41 45 56.2	85 39 45.3	2,420
T. 8 S., Rs. 11 and 12 W., corner of secs. 18, 19, 13 and 24, T road north	41 45 56.3	85 38 35.5	5,290
Michigan-Indiana State line, 15 feet east of north corner of fractional secs. 8 and 9, T. 38 N., R. 8 E., and 285 feet east of south corner of fractional secs. 19 and 20, T. 8 S., R. 11 W., iron bench mark post stamped "Prim. Trav. Sta. No. 21, 1913"	41 45 32.5	85 37 19.0	6,280

North along highways near east border of quadrangle.

Michigan-Indiana State line, east side of north and south road at south corner of fractional secs. 19 and 20, T. 8 S., R. 10 W., and 35 feet east of north corner of fractional secs. 8 and 9, T. 38 N., R. 9 E.; iron post stamped "Prim. Trav. Sta. No. 22, 1913"	41 45 33.5	85 30 21.0	.....
T. 8 S., R. 10 W., corner of secs. 17, 18, 19, and 20, center of north and south road at ditch	41 45 58.2	85 30 21.3	2,500
T. 8 S., R. 10 W., corner of secs. 7, 8, 17, and 18, crossroads at schoolhouse	41 46 50.5	85 30 21.4	5,300
T. 8 S., R. 10 W., corner of secs. 17, 18, 19, and 20, crossroads	41 51 12.5	85 30 23.6	.....
T. 7 S., R. 10 W., corner of secs. 7, 8, 17, and 18, crossroads just west of German Lutheran Church	41 52 04.8	85 30 24.0	5,300
T. 7 S., R. 10 W., corner secs. 5, 6, 7, and 8, T road west	41 52 57.4	85 30 24.6	5,320
T. 7 S., R. 10 W., quarter corner between secs. 5 and 6, T road west just north of schoolhouse	41 53 23.7	85 30 24.8	2,660
Tps. 6 and 7 S., R. 10 W., corner of secs. 31, 32, 5, and 6, center of north and south road	41 53 49.1	85 30 24.9	2,580
T. 6 S., R. 10 W., corner of secs. 29, 30, 31, and 32, center of north and south road	41 54 41.7	85 30 25.2	5,320
Centerville, 1 mile east of quarter corner between secs. 29 and 30, T. 6 S., R. 10 W., center of triangulation at road forks	41 55 07.8	85 30 25.7	2,650

Near northwest corner of quadrangle.

T. 5 S., R. 12 W., stone corner of secs. 28, 29, 32, and 33, T road west	41 59 52.9	85 43 20.7	.....

West along highways through center of quadrangle.

T. 7 S., R. 10 W., quarter corner west side of sec. 6, T road east at big oak tree	41 53 23.2	85 31 37.7	.....
Centerville, 1 mile south of, corner of Ts. 6 and 7 S., Rs. 10 and 11 W., T road west	41 53 48.7	85 31 38.2	2,580
T. 7 S., R. 11 W., north corner of secs. 1 and 2, 25 east of center of crossroads	41 53 48.2	85 32 48.1	5,290
T. 7 S., R. 11 W., north corner of secs. 2 and 3. (25 feet west of above corner is T. 6 S., R. 11 W., south corner of secs. 34 and 35, center of crossroads at schoolhouse.)	41 53 47.8	85 33 57.3	5,240
T. 7 S., R. 11 W., north corner of secs. 3 and 4, 15 feet east of center of T road south (40 feet west of above corner is T. 6 S., R. 11 W., south corner of secs. 33 and 34.)	41 53 47.4	85 35 07.5	5,310
T. 7 S., R. 11 W., north corner of secs. 4 and 5, T road south	41 53 47.1	85 36 17.5	5,300
Three Rivers, 3 miles south of, at southeast corner of crossroads 20 feet south and 35 feet east of north corner of secs. 5 and 6, T. 7 S., R. 11 W., and 20 feet south and 65 feet east of south corner of secs. 31 and 32, T. 6 S., R. 11 W.; iron post stamped "Prim. Trav. Sta. No. 23, 1913, Mich."	41 53 46.7	85 37 27.0	5,258
T road east on township line, 7 feet north and 15 feet west of mail box 58 and 1,230 feet west of railroad crossing	41 53 46.7	85 38 20.1	4,020
Florence station, T road west about 300 feet northwest of	41 53 21.9	85 38 19.5	2,510
St. Joseph River, east end of bridge over	41 53 21.3	85 38 54.0	2,609
T. 7 S., R. 12 W., quarter corner between secs. 1 and 2, T road east	41 53 20.3	85 39 48.9	4,159
T road north quarter mile east of north corner of secs. 2 and 3, T. 7 S., R. 12 W.	41 53 46.7	85 40 40.4	4,728
Center of east and west road at north and south section line	41 53 59.6	85 40 58.0	1,869
Road at north and south section line, 10 feet east of center of road south	41 53 51.8	85 42 08.5	5,391

Magnetic declination for east border of quadrangle, 0° 7′ E.; through center, 0° 10′ E.

THREE RIVERS QUADRANGLE—Continued.

South along highways near southwest corner of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T road north about ½ mile south of center of sec. 31	41 48 48.9	85 44 59.9	.....
T. 38 N., R. 7 E., quarter corner between secs. 9 and 16, center of north and south road	41 45 16.2	85 43 41.0	.....
Vistula, center of north and south road at railroad crossing	41 44 59.2	85 43 40.6	1,724
Center of east and west road at north and south section line	41 45 03.4	85 43 05.7	2,682
T road south on north and south section line	41 45 03.6	85 41 56.2	5,269
T. 38 N., R. 7 E., corner of secs. 1, 2, 11, and 12, 260 feet west of crossroads	41 45 17.6	85 40 46.3	5,487
T. 38 N., R. 7 E., east corner of secs. 1 and 2, right angle turn in road (50 feet north of above corner is T. 38 N., R. 8 E., west corner of secs. 7 and 18, line between Elkhart and La Grange counties, Indiana).	41 45 17.9	85 39 35.3	5,350
T. 8 S., R. 12 W., south corner of fractional secs. 23 and 24, center of north and south road at State line	41 45 32.3	85 39 45.3	1,649
T. 38 N., R. 8 E., corner of secs. 8, 9, 16, and 17, T road east	41 45 19.2	85 37 18.7	1,350

Magnetic declination near south border of quadrangle, 0° 19′ E.

MICHIGAN.

PRIMARY TRAVERSE.

Cement City, Rives Junction, Spring Arbor, Springport, and Stockbridge quadrangles.

JACKSON, INGHAM, EATON, AND CALHOUN COUNTIES.

The following geographic positions were determined by Oscar Jones in 1915, and are based on primary traverse positions determined by J. R. Ellis in 1912 and C. B. Kendall in 1908. (See Bulletins 551 and 440.)

CEMENT CITY QUADRANGLE.

Near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
McCain Corners, corner of secs. 1, 6, 7, and 12, T. 2 S., Rs. 1 and 2 W., center of T road west	42 13 57.6	84 28 58.3	
Crossroads	42 13 59.4	84 27 45.7	5,463
Jackson, center of Fourth and West Franklin streets	42 14 36.8	84 25 07.4	12,495
Jackson, center of Milwaukee and East Franklin streets	42 14 37.0	84 24 02.2	4,897
Jackson, center of Bridge and Belden streets	42 14 21.6	84 23 50.3	1,796
Jackson, center of Page Avenue and South Elm Avenue	42 14 35.9	84 23 04.7	3,723
Jackson, 1 mile east of, 10 feet north by 28 feet west, quarter corner between secs. 1 and 6, T. 3 S., R. 1 W., and 1 E., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 3, Mich. 1915"	42 14 24.9	84 21 54.6	5,388
T road south	42 14 18.7	84 20 48.4	5,013
T road south	42 13 58.0	84 19 37.5	5,730
Ballard Corner, crossroads	42 13 59.6	84 18 50.1	3,566
Donleys Corner, corner of secs. 2, 3, 10, and 11, T. 1 S., R. 2 W., center of crossroads	42 13 57.3	84 17 19.3	6,830
Grass Lake, 3 miles west, 1 mile south of, 28 feet north by 30 feet east, corner of secs. 1, 2, 11, and 12, T. 3 S., R. 1 E., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 4, Mich. 1915"	42 13 57.4	84 16 09.4	5,254
Leoni, crossroads at	42 14 37.6	84 16 09.9	4,067

Magnetic declination for north border of quadrangle, 0° 45′ W.

RIVES JUNCTION QUADRANGLE.

Near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 2 S., R. 1 E., corner of secs. 25, 26, 35, and 36, center of T road west	42 15 45.9	84 16 11.9	
T road south	42 17 12.0	84 16 29.8	8,826
T. 2 S., R. 1 E., corner of secs. 11, 12, 13, and 14, center of T road west	42 18 23.2	84 16 12.1	7,324
T. 2 S., R. 1 E., corner of secs. 1, 2, 11, and 12, center of T road south	42 19 15.6	84 16 12.4	5,305
T road east	42 19 15.0	84 18 13.0	9,063
Road fork	42 20 10.5	84 18 51.0	6,302
Grand Trunk Railroad crossing	42 20 29.0	84 18 51.2	1,879
Marietta, Grand Trunk Railroad crossing at	42 21 50.9	84 17 05.2	11,500
Munith, 1 mile southwest of, 42 feet north and 6 feet west, crossing of Grand Trunk R. R.; iron post stamped "Prim. Trav. Sta. No. 5, Mich. 1915"	42 22 44.0	84 15 57.4	7,400
Munith, crossing of Grand Trunk R. R., 260 feet northeast of station	42 23 26.1	84 15 02.0	5,949
T. 1 S., Rs. 1 and 2 E., corner of secs. 7, 12, 13, and 18, center of T road west	42 23 36.8	84 15 01.8	1,082

RIVES JUNCTION QUADRANGLE—Continued.

Near east border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 1 N., Rs. 1 and 2 E., corner of secs. 31 and 36, center of T road north	42 25 28.4	84 15 29.8	.....
T. 1 N., R. 1 E., corner of secs. 25 and 36, center of T road west	42 26 20.6	84 15 30.2	5,290
T. 1 N., R. 1 E., corner of secs. 24 and 25, center of T road west	42 27 13.3	84 15 30.0	5,335
T. 1 N., R. 1 E., corner of secs. 12 and 13, center of crossroads	42 28 58.9	84 15 29.8	10,683
T. 1 N., R. 1 E., quarter corner between secs. 10 and 11, center of T road north	42 29 22.8	84 17 40.01	10,052
T. 1 N., R. 1 E., corner of secs. 2, 3, 10, and 11, center road fork	42 29 48.8	84 17 50.6	2,744

Near west border of quadrangle.

Michigan Central Railroad crossing	42 23 47.9	84 29 19.1	.....
Rives Junction, 2 miles west of, 21 feet south by 23 feet west of center of sec. 13, T. 1 S., R. 2 W, center of T road east; iron post stamped "Prim. Trav. Sta. No. 7, Mich. 1915"	42 23 0.91	84 29 33.1	4,038
T. 1 S., R. 2 W., center of sec. 24, center of crossroads	42 22 16.1	84 29 33.7	5,360
T. 1 S., R. 2 W., quarter corner between secs. 25 and 36, center of T road west	42 20 57.4	84 29 33.7	7,974
T road west	42 20 50.4	84 28 58.4	2,740
Magoon Corners, corner of secs. 19 and 30, T. 2 S., R. 1 W	42 16 35.0	84 29 00.0	.....
T. 2 S., R. 2 W., corner of secs. 13 and 24, fence line	42 17 27.3	84 28 59.8	5,285
T. 2 S., R. 2 W., corner of secs. 12 and 13, fence line	42 18 19.7	84 28 59.5	5,305
Crossroads	42 19 50.0	84 28 58.9	9,142
Tps. 1 and 2 S., Rs. 1 and 2 W., corner of secs. 1, 6, 31, and 36, fence line	42 20 04.7	84 28 58.7	1,485

Through center of quadrangle.

T. 1 S., R. 1 E., corner of secs. 13, 14, 23, and 24, fence line	42 22 44.0	84 16 12.8	.....
T. 1 S., R. 1 E., quarter corner between secs. 14 and 23, center of crossroads	42 22 43.9	84 16 48.2	2,655
T. 1 S., R. 1 E., corner of secs. 14, 15, 22, and 23, fence line	42 22 43.9	84 17 23.7	2,660
T road west	42 23 06.4	84 18 00.9	3,599
T. 1 S., R. 1 E., corner of secs. 16, 17, 20, and 21, center of T road north	42 22 48.2	84 19 46.4	8,125
Henrietta Corners, corner of secs. 17, 18, 19, and 20, T. 1 S., R. 1 E., center of crossroads	42 22 48.1	84 20 57.5	5,337
T. 1 S., R. 1 W., corner of secs. 13 and 24, fence line	42 22 41.9	84 21 53.5	4,242
Henrietta, 1.5 miles west of, 29 feet south by 35 feet east of quarter corner between secs. 13 and 24, T. 1 S., R. 1 W., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 6, Mich. 1915"	42 22 41.5	84 22 28.2	2,605
T. 1 S., R. 1 W., corner of secs. 13, 14, 23, and 24, fence line	42 22 41.7	84 23 04.0	2,679
Road fork	42 22 34.8	84 24 14.6	5,345
T. 1 S., R. 1 W., quarter corner between secs. 15 and 16, center of crossroads	42 22 42.3	84 25 43.0	6,669
T. 1 S., R. 1 W., corner of secs. 16, 17, 20, and 21, center of crossroads	42 22 42.6	84 26 36.1	3,984
T road west	42 23 09.1	84 27 19.5	4,216
T. 1 S., R. 1 W., center of sec. 7, crossroads	42 24 00.4	84 28 23.1	7,054
T road southwest	42 24 09.2	84 29 03.6	3,167
T road west, at schoolhouse	42 24 27.7	84 29 32.0	2,831
Crossroads	42 25 18.9	84 29 50.0	5,362
Crossroads	42 26 10.9	84 29 49.7	5,263

Magnetic declination for east border of quadrangle, 1° 15′ W.; for west border, 0° 45′ W.; for center border, 1° W.

SPRING ARBOR QUADRANGLE.

Near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Tps. 2 and 3 S., Rs. 3 and 4 W., quarter corner between secs. 6 and 31, center of T road north	42 14 48.0	84 42 30.2	.....
Tps. 2 and 3 S., R. 3 W., corner of secs. 4, 5, 32, and 33, center of crossroads	42 14 48.7	84 40 42.6	8,097
Tps. 2 and 3 S., R. 3 W., quarter corner between secs. 3 and 34, center of crossroads	42 14 49.1	84 38 56.8	7,957
Michigan Central R. R. crossing	42 14 49.8	84 37 22.6	7,086

SPRING ARBOR QUADRANGLE—Continued.

Near north border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Parma, 0.6 mile south and 1 mile west of, 21 feet north by 35 feet east of corner of secs. 1, 2, 35, and 36, Tps. 2 and 3 S., R. 3 W., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 1, Mich. 1915"	42 14 50.0	84 37 10.4	921
Tps. 2 and 3 S., Rs. 2 and 3 W., corner of secs. 1, 6, 31, and 36, center of T road west	42 14 50.3	84 35 59.7	5,325
T. 3 S., Rs. 2 and 3 W., corner of secs. 1, 6, 7, and 12, center of T road east	42 13 57.8	84 35 56.8	5,320
T. 3 S., R. 2 W., quarter corner between secs. 5 and 8, center of T road north	42 13 57.7	84 34 16.2	7,574
T. 3 S., R. 2 W., corner of secs. 4, 5, 8, and 9, center of crossroads	42 13 57.7	84 33 40.6	2,680
Crossroads	42 13 57.9	84 32 27.4	5,506
Crossroads	42 13 58.1	84 31 01.9	6,439
Jackson, 5 miles west of, 26 feet south by 25 feet east of corner of secs. 1, 2, 11, and 12, T. 3 S., R. 2 W., center of T road south; iron post stamped "Prim. Trav. Sta. No. 2, Mich. 1915"	42 13 57.8	84 30 08.9	3,983

Magnetic declination for north border of quadrangle, 0° 30′ W.

SPRINGPORT QUADRANGLE.

Near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Crossroads	42 15 59.6	84 44 12.7	
T road north	42 15 58.9	84 43 02.6	5,270
Crossroads	42 15 28.4	84 42 30.5	3,917

Near east border of quadrangle.

Cohoon Corners, crossroads at	42 15 09.1	84 31 04.5	
T road west	42 15 42.6	84 31 04.6	3,390
T. 2 S., R. 2 W., corner of secs. 23, 24, 25, and 26, center of T road north	42 16 34.9	84 30 11.5	6,637
T. 1 N., R. 2 W., corner of secs. 23, 24, 25, and 26, center of T road north	42 27 02.9	84 30 07.5	
T. 1 N., R. 2 W., corner of secs. 13, 14, 23, and 24, center crossroads	42 27 55.0	84 30 07.5	5,270
T. 1 N., R. 2 W., corner of secs. 11, 12, 13, and 14, center of crossroads	42 28 47.2	84 30 08.0	5,280
T. 1 N., R. 2 W., corner of secs. 1, 2, 11, and 12, center of T road east	42 29 39.2	84 30 08.6	5,265
Tps. 1 and 2 N., R. 2 W., corner of secs. 1 and 2, center of crossroads, 15 feet west is corner secs. 35 and 36, T. 2. N., R. 2 W	42 30 33.6	84 30 09.1	5,513

Through center of quadrangle.

T. 1 S., R. 2 W., quarter corner between secs. 22 and 23, center of T road south	42 22 16.6	84 31 20.0	
Tompson Corner, T road north	42 22 21.9	84 32 30.6	5,330
T road west	42 22 42.8	84 33 20.3	4,290
T. 1 S., R. 2 W., corner secs. 17, 18, 19, and 20, center of T road north	42 22 42.7	84 34 51.3	6,834
T. 1 S., Rs. 2 and 3 W., corner of secs. 13, 18, 19, and 24, center of crossroads	42 22 42.6	84 36 02.0	5,310
Springport, 4 miles east of, 25 feet south by 29 feet east of corner of secs. 13, 14, 23, and 24, T. 1 S., R. 3 W., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 8, Mich. 1915"	42 22 41.2	84 37 12.8	5,316
T road east	42 22 41.8	84 38 06.0	3,995
T. 1 S., R. 3 W., corner of secs. 15, 16, 21, and 22, center of T road west	42 22 41.7	84 39 34.8	6,666
T. 1 S., R. 3 W., corner of secs. 16, 17, 20, and 21, center of crossroads	42 22 41.5	84 40 45.8	5,330
Springport, New York Central R. R. crossing	42 22 41.4	84 41 33.6	3,590
T. 1 S., R. 3 W., corner of secs. 17, 18, 19, and 20, center of crossroads	42 22 41.2	84 41 56.5	1,719
T. 1 S., Rs. 3 and 4 W., corner of secs. 18 and 19, fence line	42 22 41.5	84 43 07.3	5,320
Crossroads	42 22 53.8	84 44 00.3	4,169

Magnetic declination through center of quadrangle, 1° W.; for east border, 0° 45′ W.; for south border, 0° 30′ W.

STOCKBRIDGE QUADRANGLE.

Near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Crossroads at schoolhouse	42 24 12.4	84 14 47.1	.....
T road south	42 25 28.5	84 14 36.2	7,742

Galesburg, Hasting, Kalamazoo, and Wayland quadrangles.

ALLEGAN, BARRY, AND KALAMAZOO COUNTIES.

The following geographic positions were determined by Oscar Jones in 1915 and are based on primary traverse positions by J. R. Ellis, 1911. (See Bulletin 551.) All are on North American datum.

GALESBURG QUADRANGLE.

Near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 2 S., R. 10 W., corner of secs. 16, 17, 20, and 21, center of T road north	42 17 18.5	85 29 33.2	.....
T. 2 S., R. 10 W., corner of secs. 8, 9, 16, and 17, center of T road. south	42 18 10.8	85 29 33.5	5,300
T. 2 S., R. 10 W., corner of secs. 9, 10, 15, and 16, center of crossroads	42 18 10.7	85 28 23.3	5,270
T. 2 S., R. 10 W., corner of secs. 3, 4, 9, and 10, center of T road south	42 19 02.9	85 28 23.9	5,288
T. 2 S., R. 10 W., corner of secs. 4, 5, 8, and 9, center of T road north	42 19 03.0	85 29 34.3	5,287
T. 2 S., R. 10 W., corner of secs. 4 and 5, center of T road south	42 19 57.6	85 29 34.8	5,540
Crossroads	42 20 24.9	85 29 36.7	2,770
T. 1 S., R. 10 W., corner of secs. 28, 29, 32, and 33, center of T road west	42 20 49.8	85 29 37.3	2,519
T. 1 S., R. 10 W., corner of secs. 20, 21, 28, and 29, center of T road west	42 21 42.0	85 29 38.6	5,291
Springbrook, 2 miles south of, 24 feet south by 28 feet east, corner of secs. 16, 17, 20, and 21, T. 1 S., R. 10 W., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 2, Mich. 1915."	42 22 34.4	85 29 40.2	5,314

Near east border of quadrangle.

Springbrook, crossing of Kalamazoo, Lake Shore & Chicago Ry. with Michigan Electric interurban	42 24 04.3	85 29 48.8	.....
Springbrook, 1 mile northeast of, at crossing of Kalamazoo, Lake Shore & Chicago Ry	42 24 45.0	85 29 15.2	4,831
T. 1 N., R. 10 W., quarter corner between secs. 33 and 34, center of crossroads	42 25 41.9	85 29 03.3	5,822
T road west	42 27 26.7	85 29 24.4	10,725
Crossroads	42 27 52.9	85 29 33.7	2,750
T. 1 N., R. 10 W., quarter corner between secs. 9 and 16, center of crossroads	42 28 45.1	85 29 38.1	5,287
Crossroads	42 29 46.2	85 29 38.3	6,188

Magnetic declination for west border of quadrangle, 1° 20′ E.

HASTING QUADRANGLE.

Near southwest corner of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Prairieville, 2 miles west of, 7 feet east of quarter corner of sec. 4, T. 1 N., R. 10 W., 35 feet south by 30 feet west of center of cross-roads; iron post stamped "Prim. Trav. Sta. No. 4, Mich. 1915"	42 30 30.7	85 29 39.2	.....

Magnetic declination for southwest corner of quadrangle, 2° 0′ E.

KALAMAZOO QUADRANGLE.

Near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 2 S., R. 12 W., quarter corner between secs. 20 and 21, center of crossroads	42 16 52.0	85 43 34.2	.....
T. 2 S., R. 12 W., corner of secs. 20, 21, 28, and 29, center of T road east	42 16 25.8	85 43 34.3	2,640
T. 2 S., R. 12 W., quarter corner between secs. 28 and 29, center of T road east	42 15 59.6	85 43 34.6	2,650
Miller, crossing Michigan Central R. R.	42 16 00.3	85 42 29.9	4,870
T. 2 S., R. 12 W., quarter corner between secs. 26 and 27, center of T road west	42 16 00.5	85 41 14.8	5,648
Oshtemo, crossroads at	42 15 32.5	85 40 39.8	3,863
T. 2 S., Rs. 11 and 12 W., corner of secs. 25, 20, 31, and 36, center of crossroads	42 15 35.5	85 38 54.6	7,916
T road west	42 15 34.8	85 36 51.3	9,278
T. 2 S., R. 11 W., corner of secs. 27, 28, 33, and 34, center of T road east	42 15 34.8	85 35 23.2	6,625
Burdock Street school, center of crossroads at school	42 15 34.4	85 34 47.7	2,668
T. 2 S., R. 11 W., corner of secs. 25, 26, 35, and 36, center of T road north	42 15 34.3	85 33 02.5	7,908
T. 2 S., Rs. 10 and 11 W., corner of secs. 25 and 26, center of T road west	42 15 34.1	85 31 51.4	5,350
Comstock, 2 miles south of, 30 feet east of center of T road east, and corner of secs. 29, 30, 31, and 32, T. 2 S., R. 10 W.; iron post stamped "Prim. Trav. Sta. No. 1, Mich. 1915"	42 15 34.1	85 30 42.6	5,170

North near east border of quadrangle.

Comstock, T road south at	42 17 18.6	85 30 48.6	10,587
Springbrook, 1 mile southwest of Kalamazoo, Lake Shore & Chicago Ry. crossing	42 23 39.7	85 30 15.8	.....

Through center of quadrangle.

T road west	42 22 47.6	85 30 14.8	.....
T. 1 S., Rs. 10 and 11 W., quarter corner between secs. 13 and 18, center of T road east	42 23 01.2	85 31 55.2	7,662
T. 1 S., Rs. 10 and 11 W., corner of secs. 13, 24, 18, and 19, center of T road west	42 22 34.6	85 31 55.3	2,691
Crossroads at cemetery	42 22 34.5	85 33 09.5	5,567
Coopers, crossing, Lake Shore & Michigan Southern R. R.	42 22 34.7	85 34 27.7	5,870
T. 1 S., R. 11 W., corner of secs. 15, 16, 21, and 22, center of T road south	42 22 35.3	85 35 26.5	4,415
Cooper Center, 20 feet north by 50 feet east of corner of secs. 16, 17, 20, and 21, T. 1 S., R. 11 W., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 3, Mich. 1915"	42 22 35.5	85 36 36.8	5,276
T. 1 S., R. 11 W., corner of secs. 17, 18, 19, and 20, center of cross-roads	42 22 35.3	85 37 48.7	5,397
T. 1 S., Rs. 11 and 12 W., corner of secs. 18 and 19, corner of secs. 13 and 24, 25 feet south of crossroads	42 22 35.3	85 38 57.3	5,149
T. 1 S., R. 12 W., corner of secs. 13, 14, 23, and 24, fence line	42 22 32.8	85 40 08.2	5,328
T. 1 S., R. 12 W., corner of secs. 15, 16, 21, and 22, center of cross-roads at Alamo	42 22 30.1	85 42 28.7	10,552
T. 1 S., R. 12 W., corner of secs. 9, 10, 15, and 16, center of cross-roads	42 23 22.2	85 42 31.0	5,283
T. 1 S., R. 12 W., corner of secs. 8, 9, 16, and 17, fence line north and south	42 23 22.1	85 43 41.5	5,289

Magnetic declination for south border of quadrangle, 0° 30′ E.; for center, 1° 30′ E.

WAYLAND QUADRANGLE.

Near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Crossroads	42 30 30.7	85 30 40.2	
T road northwest	42 30 16.6	85 32 01.9	6,275
T road southwest	42 30 53.0	85 32 34.9	4,432
T road west	42 30 31.6	85 32 58.2	2,780
Hooper station, road crossing of Michigan Ry. Co. electric line	42.30 36.6	85 33 46.5	3,653
T. 2 N., R. 10 W., corner of secs. 35 and 36	42 30 31.9	85 33 47.0	480
T. 2 N., R. 10 W., corner of secs. 34 and 35, center of T road north	42 30 31.8	85 34 57.4	5,270
T. 2 N., R. 10 W., corner of secs. 33 and 34, center of T road north	42 30 31.4	85 36 08.0	5,290
Monteith, 1 mile south of, 23 feet north by 72 feet west of, corner of secs. 32 and 33, T. 2 N., R. 10 W., center of T road north, 23 feet north by 63 feet east of, corner of secs. 4 and 5, T. 1 N., R. 10 W., center of T road south; iron post stamped "Prim. Trav. Sta. No. 5, Mich. 1915"	42 30 30.8	85 37 19.9	5,381
T. 2 N., R. 11 W., corner of secs. 31 and 32, 30 feet west of center of crossroads	42 30 29.6	85 38 29.4	5,210
Tps. 1 and 2 N., Rs. 11 and 12 W., township corner, center of T road north	42 30 28.6	85 39 43.0	5,510
Tps. 1 and 2 N., R. 12 W., corner of secs. 1, 2, 35, and 36, center of crossroads	42 30 28.5	85 40 53.6	5,288
T. 2 N., R. 12 W., corner of secs. 34 and 35, center of T road north	42 30 28.4	85 42 04.0	5,270
T. 1 N., R. 12 W., corner of secs. 3 and 4, center of T road south	42 30 28.3	85 43 15.0	5,320
Abronia, Lake Shore & Michigan Southern R. R. crossing, 360 feet south of station	42 30 31.1	85 44 28.1	5,481

Magnetic declination for south border of quadrangle, 1° 0′ E.

Cedar Springs, Grove, Ravenna, and Smyrna quadrangles.

KENT COUNTY.

The following geographic positions on approximate North American datum were determined by primary traverse in 1915, by Oscar Jones, based upon positions of 1911, published in Bulletin No. 551.

CEDAR SPRINGS QUADRANGLE.

Near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 10 N., R. 10 W., corner secs. 16, 17, 20, and 21; T road west	43 14 58.3	85 30 41.3	
T. 10 N., R. 10 W., corner secs. 17, 18, 19, and 20; T road east	43 14 58.1	85 31 53.2	5,320
T. 10 N., R. 10 W., corner secs. 19, 20, 29, and 30; crossroads	43 14 05.5	85 31 52.4	5,320
T road east	43 13 54.3	85 33 05.8	5,546
T. 10 N., R. 11 W., quarter corner between secs. 23 and 24; T road west	43 14 30.0	85 34 17.5	
T. 10 N., R. 11 W., quarter corner between secs. 22 and 23, crossroads	43 14 29.6	85 35 29.4	5,320
T. 10 N., R. 11 W., corner of secs. 14, 15, 22, and 23; T road west	43 14 55.6	85 35 29.7	2,630
Cedar Springs, 3 miles west and 2 miles north of, 34 feet west by 30 feet south of crossroads and corner of secs. 15, 16, 21, and 22, T. 10 N., R. 11 W.; iron post stamped "Prim. Trav. Sta. No. 2, Mich. 1915"	43 14 54.6	85 36 42.0	5,354
T. 10 N., R. 11 W., corner secs. 17, 18, 19, and 20; T road north	43 14 54.8	85 39 04.8	10,568
T. 10 N., Rs. 11 and 12 W., corner secs. 13, 18, 19, and 24; stone post	43 14 56.0	85 40 20.9	5,635
T road west	43 14 03.5	85 40 20.3	5,321
T road north	43 14 04.2	85 41 32.6	5,350
T. 10 N., R. 12 W., corner secs. 22, 23, 26, and 27; T road south	43 14 04.0	85 42 43.8	5,275
T. 10 N., R. 12 W., quarter corner secs. 22 and 27; crossroads at schoolhouse	43 14 04.1	85 43 19.4	2,630
T. 10 N., R. 12 W., quarter corner between secs. 15 and 22; crossroads	43 14 56.5	85 43 20.1	5,298
T. 10 N., R. 12 W., corner secs. 15, 16, 21, and 22; crossroads	43 14 56.4	85 43 55.6	2,630
T. 8 N., R. 12 W., corner secs. 4, 5, 8, and 9; crossroads	43 06 09.6	85 44 56.3	
T. 8 N., R. 12 W., corner secs. 8, 9, 16, and 17; crossroads	43 05 17.7	85 44 55.6	5,260
T. 8 N., R. 12 W., corner secs. 16, 17, 20, and 21; crossroads	43 04 25.5	85 44 55.5	5,280
T. 8 N., R. 12 W., corner secs. 20, 21, 28, and 29; T case north	43 03 33.7	85 44 55.9	5,250
Tps. 7 and 8 N., R. 12 W., quarter corner between secs. 4 and 33; crossroads	43 01 48.7	85 44 20.5	10,946
T. 8 N., R. 12 W., quarter corner between secs. 4 and 9; T road north	43 00 55.5	85 44 19.4	5,391

CEDAR SPRINGS QUADRANGLE—Continued.

East through center of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 9 N., R. 12 W., corner secs. 33 and 34; fence line north	43 07 02.8	85 43 49.0	
T. 9 N., R. 12 W., corner secs. 34 and 35; T road north	43 07 01.7	85 42 37.4	5,310
T. 8 N., R. 12 W., corner secs. 1 and 2; crossroads	43 07 00.6	85 41 25.5	5,336
Tps. 8 and 9 N., Rs. 11 and 12 W., corner of secs. 1, 6, 31, and 36; crossroads	43 07 00.1	85 40 13.9	5,305
Tps. 8 and 9 N., R. 11 W., corner of secs. 5, 6, 31, and 32; T road north	43 07 00.3	85 39 03.8	5,200
Rockford, 3 miles west of, 32 feet north by 32 feet east, T road north, corner of secs. 4, 5, 32, and 33, Tps. 8 and 9 N., R. 11 W.; iron post stamped "Prim. Trav. Sta. No. 5, Mich. 1915"	43 07 01.6	85 36 39.7	10,690
T road north	43 07 02.0	85 35 07.7	6,824
T road south	43 07 02.8	85 33 57.2	5,230
Rockford, center of main track Grand Rapids & Indiana R. R., 460 feet south of station	43 07 11.6	85 33 41.5	1,465
Tps. 8 and 9 N., Rs. 10 and 11 W., corner secs. 1, 6, 31 and 36	43 07 03.1	85 33 04.0	2,914
T road north	43 07 13.6	85 31 51.1	5,506
Tps. 8 and 9 N., R. 10 W., corner of secs. 4, 5, 32, and 33, road fork	43 07 03.6	85 30 39.6	5,409

Magnetic declination for north border of quadrangle, 0° 40′ W.; for center, 0° 0′.

GROVE QUADRANGLE.

Near south border.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 10 N., R. 11 W., quarter corner between secs. 13 and 18; crossroads	43 15 22.8	85 33 06.1	
White Creek school and church, T. 10 N., R. 11 W., quarter corner secs. 14 and 13; crossroads	43 15 22.0	85 34 17.4	5,278

RAVENNA QUADRANGLE.

Near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Kent City, 2 miles north of, 34 feet south by 24 feet west of, corner of secs. 16, 17, 20, and 21, T. 10 N., R. 12 W., at crossroads; iron post stamped "Prim. Trav. Sta. No. 3, Mich. 1915."	43 14 55.3	85 45 07.3	
T. 10 N., R. 12 W., corner of secs. 20, 21, 28, and 29; crossroads	43 14 03.2	85 45 06.5	5,278
Kent City, corner of secs. 28, 29, 32, and 33, T. 10 N., R. 12 W., crossroads	43 13 10.7	85 45 05.4	5,316
T. 10 N., R. 12 W., corner of secs. 32 and 33; 20 feet east is corner of secs. 4, 5, T. 9 N. R. 12 W.	43 12 18.4	85 45 04.5	5,300
T. 9 N., R. 12 W., corner of secs. 4, 5, 8, and 9; crossroads	43 11 26.2	85 45 03.6	5,279
T. 9 N., R. 12 W., corner of secs. 8, 9, 16, and 17, crossroads at schoolhouse	43 10 33.7	85 45 02.8	5,320
T. 9. N., R. 12 W., corner of secs. 16, 17, 20, and 21; crossroads	43 09 41.3	85 45 01.7	5,300
T. 9 N., R. 12 W., corner of secs. 20, 21, 28, and 29; crossroads	43 08 48.9	85 45 01.2	5,310
T. 9 N., R. 12 W., corner of secs. 28, 29, 32, and 33; T road east	43 07 56.5	85 45 00.8	5,299
Ballardsville, 3 miles west of; 31 feet south by 24 feet east of T road north and corner of secs. 32 and 33, T. 9 N., R. 12 W.; iron post stamped "Prim. Trav. Sta. No 4, Mich. 1915."	43 07 03.6	85 45 00.4	5,358
T. 8 N., R. 12 W., corner of secs. 5, 6, 7, and 8; T road south	43 00 57.8	85 46 06.1	
Walker station, at crossroads, 30 feet south by 30 feet west of corner of secs. 7, 8, 17, and 18, T. 7 N., R. 12 W.; iron post stamped "Prim. Trav. Sta. No. 11, Mich. 1911."	43 00 05.0	85 46 04.1	5,340

Magnetic declination for northeast corner of quadrangle, 1° 20′ W.; for southeast corner, 1° 20′ E.

SMYRNA QUADRANGLE.

North along public highway near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Ada, 3 miles north by 0.5 mile east of, 300 feet south of corner of secs. 10, 11, 14, and 15, T. 7 N., R. 10 W., at fork of road; iron post stamped "Prim. Trav. Sta. No. 14, Mich. 1911"	43 00 01.4	85 28 18.3	.....
T road west	43 00 56.5	85 28 27.6	5,621
T. 7 N., R. 10 W., corner secs. 2 and 3, T road south; 200 feet east is T road north, corner secs. 34 and 35, T 8 N., R. 10 W	43 01 43.0	85 28 17.3	4,761
T. 8 N., R. 10 W., corner secs. 26, 27, 34, and 35; crossroads	43 02 35.2	85 28 14.2	5,298
Cannonsburg, T road south	43 03 14.8	85 28 13.0	4,006
T. 8 N., R. 10 W., center sec. 2; cross roads	43 03 53.3	85 28 49.9	4,773
T. 8 N., R. 10 W., quarter corner between secs. 10 and 15; T road south	43 05 11.4	85 28 50.1	7,909
T. 8 N., R. 10 W., corner of secs. 10, 11, 14, and 15; T road north	43 05 11.9	85 28 14.4	2,651
T. 8 N., R. 10 W., corner secs. 2, 3, 10, and 11; crossroads at schoolhouse	43 06 04.1	85 28 14.5	5,280
Rockford, 5 miles east of, 15 feet south of T road north and corner secs. 34 and 35, T. 9 N., R. 10 W.; iron post stamped "Prim. Trav. Sta. No. 6, Mich. 1915"	43 07 04.3	85 28 16.6	6,098
T. 9 N., R. 10 W., corner secs. 26, 27, 34, and 35; T road west	43 07 56.8	85 28 16.5	5,310
T. 9 N., R. 10 W., corner secs. 22, 23, 26, and 27; fence line east and west	43 08 49.0	85 28 16.5	5,290
T. 9 N., R. 10 W., corner secs. 14, 15, 22, and 23; T road south	43 09 41.4	85 28 16.8	5,310
T. 9 N., R. 10 W., corner secs. 10, 11, 14, and 15; T road north	43 10 34.0	85 28 14.1	5,322
T. 9 N., R. 10 W., corner secs. 2, 3, 10, and 11; T road west	43 11 26.4	85 28 14.2	5,310
Tps. 9 and 10 N., R. 10 W., corner secs. 2, 3, 34, and 35; T road south	43 12 21.8	85 28 14.1	5,600
T. 10 N., R. 10 W., corner secs. 26, 27, 34, and 35; T road west	43 13 13.9	85 28 17.4	5,286
T. 10 N., R. 10 W., corner secs. 22, 23, 26, and 27; crossroads	43 14 06.2	85 28 17.8	5,299
Cedar Springs, 2 miles north and 4 miles east of, 19 feet west by 32 feet south of crossroads and corner secs. 14, 15, 22, and 23, T. 10 N., R. 10 W.; iron post stamped "Prim. Trav. Sta. No. 1, Mich. 1915"	43 14 58.3	85 28 18.3	5,269
T. 10 N., R. 10 W., corner secs. 15, 16, 21, and 22; T road east	43 14 58.6	85 29 29.5	5,269

Magnetic declination for west border of quadrangle, 0° 30′ W.

Near east border of quadrangle.

	° ′ ″	° ′ ″	*Feet.*
T. 10 N., R. 8 W., corner of secs. 21, 22, 27, and 28, center of crossroads	43 14 08.2	85 15 09.1	.....
T. 10 N., R. 8 W., corner of secs. 27, 28, 33, and 34, fence line	43 13 15.8	85 15 09.8	5,310
T. 10 N., R. 8 W., corner of secs. 33 and 34, 10 feet west, corner of secs. 3 and 4, T. 9 N., R. 8 W., center of T road west	43 12 23.3	85 15 10.5	5,320
Pere Marquette R. R. crossing	43 12 13.3	85 15 11.4	1,010
T. 9 N., R. 8 W., corner of secs. 3, 4, 9, and 10, center of T road east	43 11 31.1	85 15 11.7	4,270
T. 9 N., R. 8 W., corner of secs. 9, 10, 15, and 16, street crossing, Greenville	43 10 39.0	85 15 12.1	5,280
Greenville, intersection south Lafayette Street and Fairplain Street, quarter corner between secs. 15 and 16, T. 9 N., R. 8 W.	43 10 12.8	85 15 12.2	2,658
T. 9 N., R. 8 W., corner of secs. 15, 16, 21, and 22, fence line	43 09 46.6	85 15 12.2	2,650
Crossroads	43 08 54.1	85 15 47.7	5,927
Belding, 2 miles west by 1.5 miles north of, 25 feet south by 31 feet east, is quarter corner of sec. 4, T. 8 N., R. 8 W., center of T road south, 25 feet south by 114 feet east, quarter corner of sec. 33, T. 9 N., R. 8 W., center of T road south; iron post stamped "Prim. Trav. Sta. No. 17, Mich. 1915"	43 07 09.4	85 15 46.4	10,602
Smyrna, west end of iron bridge over Flat River	43 03 31.6	85 15 18.1	.....
Smyrna, center of crossroads, quarter corner between secs. 21 and 28, T. 8 N., R. 8 W	43 03 33.5	85 15 47.2	2,173
T. 8 N., R. 8 W., center of secs. 21, center of T road west	43 03 59.9	85 15 46.9	2,675
T. 8 N., R. 8 W., quarter corner between secs. 9 and 16, center of crossroads	43 05 18.3	85 15 46.0	7,939
T. 8 N., R. 8 W., quarter corner between secs. 4 and 9, center of crossroads	43 06 10.2	85 15 45.8	5,258
T. 8 N., R. 8 W., center of sec. 4, center of crossroads	42 06 36.4	85 15 46.3	2,684

Near south border of quadrangle.

Vergennes, 1 mile south and 2 miles west of, 27 feet north by 14 feet west is corner of secs. 8, 9, 16, and 17, T. 7 N., R. 9 W., center of T road north; iron post stamped "Prim. Trav. Sta. No. 25, Mich. 1915"	43 00 06.8	85 23 29.5	.....
T. 7 N., R. 9 W., corner of secs. 7, 8, 17, and 18, center of crossroads	43 00 06.1	85 24 40.1	5,246
T. 7 N., R. 10 W., quarter corner between secs. 12 and 13, center of crossroads	43 00 06.2	85 26 28.7	8,072

Magnetic declination near west border of quadrangle, 0° 30′ W.; near east border, 0° 30′ W.; near south border, 0° 30′ W.

Clare, Edmore, Fenwick, Howard City, Ionia, Ithaca, Lowell, Mount Pleasant, Remus, Sears, and Vestaburg quadrangles.

BARRY, CLINTON, EATON, GRATIOT, IONIA, ISABELLA, KENT, AND MONTCALM COUNTIES.

The following geographic positions were determined by primary traverse in 1915, by Oscar Jones, and are based on primary traverse positions determined by J. R. Ellis in 1912, and J. H. Wilson in 1913, on approximate North American datum.

CLARE QUADRANGLE.

Near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 16 N., R. 4 W., corner of secs. 19, 20, 29, and 30, center of T road west	43 45 22.7	84 49 39.3	
T. 16 N., Rs. 4 and 5 W., corner of secs. 19, 24, 25, and 30, center of crossroads	43 45 21.8	84 50 55.5	5,589
T. 16 N., R. 5 W., corner of secs. 23, 24, 25, and 26, center of T road south	43 45 20.7	84 52 06.0	5,179
Gilmore, 35 feet north by 27 feet east, of corner of secs. 22, 23, 26, and 27, T. 16 N., R. 5 W., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 4, Mich. 1915."	43 45 20.6	84 53 17.5	5,248
T. 16 N., R. 5 W., corner of secs. 21, 22, 27, and 28, center of crossroads	43 45 20.3	84 54 29.9	5,317
T. 16 N., R. 5 W., corner of secs. 20, 21, 28, and 29, center of crossroads	43 45 20.2	84 55 41.7	5,270
T. 16 N., Rs. 5 and 6 W., corner of secs. 19, 24, 25, and 30, center of crossroads	43 45 19.8	84 58 06.1	10,598
T. 16 N., R. 6 W., corner of secs. 23, 24, 25, and 26, center of crossroads	43 45 19.7	84 59 18.0	5,280

Magnetic declination for south border of quadrangle, 1° 30′ W.

EDMORE QUADRANGLE.

Near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 10 N., R. 6 W., corner of secs. 8, 9, 16, and 17, center of crossroads	43 15 50.6	85 02 00.9	
T. 10 N., R. 6 W., corner of sec. 4, 5, 8, and 9, center of crossroads	43 16 42.7	85 02 01.1	5,278
T. 10 N., R. 6 W., corner of secs. 4 and 5, center of T road south	43 17 32.9	85 02 03.0	5,080
T. 11 N., R. 6 W., corner of secs. 33 and 34, center of T road north	43 17 32.8	85 01 29.7	2,460
T. 11 N., R. 6 W., corner of secs. 27, 28, 33, and 34, center of crossroads	43 18 24.9	85 01. 28.5	5,270
T. 11 N., R. 6 W., corner of secs. 21, 22, 27, and 28, center of crossroads	43 19 16.7	85 01 28.3	5,250
T. 11 N., R. 6 W., corner of secs. 15, 16, 21, and 22, center of crossroads	43 20 08.8	85 01 28.0	5,270
T. 11 N., R. 6 W., corner of secs. 9, 10, 15, and 16, center of crossroads	43 21 01.0	85 01 27.8	5,290
T. 11 N., R. 6 W., corner of secs. 3, 4, 9, and 10, center of T road east	43 21 52.8	85 01 27.8	5,240
Edmore, 2 miles south by 1 mile east of, 31 feet south by 33 feet west of corner of secs. 3 and 4, T. 11 N., R. 6 W., 31 feet south by 49 feet west of corner of secs. 33 and 34, T. 12 N., R. 6 W., crossroads; iron post stamped "Prim. Trav. Sta. No. 12, Mich. 1915."	43 22 44.6	85 01 28.3	5,245
T. 12 N., R. 6 W., corner of secs. 34 and 35, center of T road north	43 22 44.9	85 00 16.5	
T. 12 N., R. 6 W., corner of secs. 26, 27, 34, and 35, center of crossroads	43 23 36.9	85 00 16.4	5,278
T. 12 N., R. 6 W., corner of secs. 22, 23, 26, and 27, center of crossroads	43 24 28.8	85 00 17.3	5,258
T. 12 N., R. 6 W., corner of secs. 14, 15, 22, and 23, center of crossroads	43 25 20.8	85 00 18.1	5,260
T. 12 N., R. 6 W., corner of secs. 10, 11, 14, and 15, center of T road east	43 26 12.7	85 00 18.2	5,260
T. 12 N., R. 6 W., corner of secs. 2, 3, 10, and 11, center of crossroads	43 27 04.7	85 00 18.7	5,260
T. 13 N., R. 6 W., corner of secs. 34 and 35, center of crossroads	43 27 57.7	85 00 18.2	5,370
T. 13 N., R. 6 W., corner of secs. 26, 27, 34, and 35, center of T road east	43 28 49.8	85 00 19.1	5,279
T. 13 N., R. 6 W., corner of secs. 22, 23, 26, and 27; center of T road east	43 29 42.0	85 00 20.0	5,280

EDMORE QUADRANGLE—Continued.

Near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 10 N., R. 7 W., corner of secs. 17, 18, 19, and 20, center of T road south	43 15 00.3	85 10 26.1	
T. 10 N., Rs. 7 and 8 W., corner of secs. 13, 18, 19, and 24, center of T road north	43 15 00.9	85 11 33.8	5,009
T. 10 N., R. 8 W., corner of secs. 13, 14, 23, and 24, center of T road north	43 15 00.5	85 12 45.0	5,267

Magnetic declination for east border of quadrangle, 0° 45′ W.; for south border, 0° 45′ W.

FENWICK QUADRANGLE.

Near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 10 N., R. 6 W., corner of secs. 15, 16, 21, and 22, center of cross-roads	43 14 58.8	85 00 49.5	
T. 10 N., R. 6 W., corner of secs. 16, 17, 20, and 21, center of cross-roads	43 14 58.8	85 02 00.9	5,280
T. 10 N., R. 6 W., corner of secs. 17, 18, 19, and 20, center of cross-roads	43 14 58.8	85 03 12.4	5,290
T. 10 N., R. 7 W., corner of secs. 13 and 24, center of T road west	43 14 59.5	85 04 25.5	5,407
T. 10 N., R. 7 W., corner of secs. 13, 14, 23, and 24, center of T road north	43 14 59.9	85 05 37.5	5,329
Sidney, 1 mile east of, 28 feet south by 17 feet west, is corner of secs. 14, 15, 22, and 23, T. 10 N., R. 7 W., center of T road north; iron post stamped "Prim. Trav. Sta. No. 15, Mich. 1915"	43 14 59.9	85 06 49.5	5,324
Pere Marquette R. R. crossing	43 15 00.0	85 07 36.6	3,489
Sidney, crossroads at corner of secs. 15, 16, 21, and 22, T. 10 N., R. 7 W	43 15 00.0	85 08 00.4	1,760
T. 10 N., R. 7 W., corner of secs. 16, 17, 20, and 21, center of cross-roads	43 14 58.5	85 09 12.5	5,340
T. 10 N., R. 8 W., corner of secs. 14, 15, 22, and 23	43 14 59.2	85 13 58.3	

Near west border of quadrangle.

Crossroads at schoolhouse	43 01 50.5	85 14 54.0	
Crossroads	43 02 16.5	85 14 54.0	2,636
Crossroads	43 03 08.3	85 14 53.7	5,246

Near south border of quadrangle.

T. 7 N., R. 6 W., corner of secs. 9, 10, 15, and 16, center of road fork	43 00 06.7	85 00 54.5	
T. 7 N., R. 6 W., corner of secs. 7, 8, 17, and 18, fence line	43 00 07.2	85 03 16.9	
T. 7 N., R. 6 W., quarter corner between secs. 7 and 8, center of crossroads	43 00 33.4	85 03 17.3	2,655
T. 7 N., R. 6 W., quarter corner west side of sec. 7, 25 feet south is quarter corner east side sec. 12, T. 7 N., R. 7 W., crossroads	43 00 33.4	85 04 30.6	5,449
T. 7 N., R. 7 W., center of sec. 12, center of T road north	43 00 33.2	85 05 05.9	2,618
T. 7 N., R. 7 W., center of sec. 12, center of T road north	43 00 33.2	85 06 16.8	5,265
Ionia, 3 miles west and 2 miles north of, 18 feet south by 32 feet east is quarter corner between secs. 10 and 11, T. 7 N., R. 7 W., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 23, Mich. 1915"	43 00 32.7	85 06 51.8	2,603
T. 7 N., R. 7 W., quarter corner between secs. 9 and 10, center of crossroads	43 00 33.5	85 08 03.6	5,332
T. 7 N., R. 7 W., corner of secs. 9, 10, 15, and 16, center of T road east	43 00 07.5	85 08 03.7	2,630
T. 7 N., R. 7 W., quarter corner between secs. 7 and 18, center of T road north	43 00 07.3	85 09 50.6	
T. 7 N., R. 7 W., corner of secs. 7, 8, 17, and 18, center of crossroads	43 00 07.3	85 10 26.3	2,648
T. 7 N., R. 7 W., corner of secs. 7 and 18, 25 feet south is corner of secs. 12 and 13, T. 7 N., R. 8 W., fence line	43 00 07.4	85 11 37.8	5,312
T. 7 N., R. 8 W., corner of secs. 11, 12, 13, and 14, center of T road east	43 00 07.3	85 12 48.9	5,279
T. 7 N., R. 8 W., quarter corner between secs. 11 and 12, center of T road west	43 00 33.5	85 12 48.7	2,650

FENWICK QUADRANGLE—Continued.

Near south border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 7 N., R. 8 W., center of sec. 11, center of T road north	43 00 33.7	85 13 24.4	2,648
T. 7 N., R. 8 W., quarter corner between secs. 10 and 11, center of T road south	43 00 33.8	85 13 59.6	2,612
T road east	43 00 39.2	85 14 53.5	4,044
Saranac, 5 miles north by 2 miles west of; 17 feet north by 22 feet west is center of T road north; iron post stamped "Prim. Trav. Sta. No. 24, Mich. 1915"	43 00 07.0	85 14 53.4	3,263

Through center of quadrangle.

Crossroads	43 07 10.0	85 14 54.0	.....
East end of iron bridge over White River	43 07 11.0	85 13 26.3	6,506
T. 9 N., R. 8 W., corner of secs. 35 and 36, center of T road north	43 07 11.1	85 12 48.6	2,785
Pere Marquette R. R. crossing	43 07 37.5	85 12 48.6	2,680
T. 9 N., R. 8 W., corner of secs. 25, 26, 35, and 36, center of T road east	43 08 03.2	85 12 48.7	2,600
T. 9 N., Rs. 7 and 8 W., corner of secs. 25, 30, 31, and 36, center of T road south	43 08 03.0	85 11 37.3	5,295
T. 9 N., R. 7 W., corner of secs. 29, 30, 31, and 32, center of T road east	43 08 02.4	85 10 24.5	5,393
T. 9 N., R. 7 W., corner of secs. 28, 29, 32, and 33, center of crossroads	43 08 03.0	85 09 13.9	5,231
T. 8 N., R. 7 W., corner of secs. 4 and 5, center of T road east	43 07 11.2	85 09 18.4	5,253
Tps. 8 and 9 N., R. 7 W., corner of secs. 3, 4, 33, and 34, center of crossroads	43 07 11.5	85 08 06.0	5,355
Shiloh, 2 miles west and 1 mile north of, T road south; iron post stamped "Prim. Trav. Sta. No. 18, Mich. 1915"	43 07 11.7	85 07 19.5	3,449
T. 9 N., R. 7 W., quarter corner between secs. 34 and 35, center of T road north	43 07 39.2	85 06 52.6	3,422
T. 9 N., R. 7 W., quarter corner between secs. 35 and 36, center of crossroads	43 07 38.6	85 05 41.5	5,266
Pere Marquette R. R. crossing	43 07 38.7	85 05 19.4	1,640
Tps. 8 and 9 N., Rs. 6 and 7 W., corner of secs. 1, 6, 31, and 36, center of T road north	43 07 12.7	85 04 30.3	3,734
Tps. 8 and 9 N., R. 6 W., corner of secs. 5, 6, 31, and 32, fence line	43 07 12.5	85 03 17.6	5,390
Tps. 8 and 9 N., R. 6 W., corner of secs. 4, 5, 32, and 33, center of T road west	43 07 11.9	85 02 06.5	5,270
T. 8 N., R. 6 W., quarter corner between secs. 3 and 4, center of crossroads	43 06 44.5	85 00 55.2	5,972

Magnetic declination near north border of quadrangle, 0° 45′ W.; near west border, 0° 30′ W.; near south border, 0° 30′ W.; through center, 0° 30′ W.

HOWARD CITY QUADRANGLE.

Near southeast corner of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Greenville, 5 miles north of, 25 feet north by 29 feet west of, corner of secs. 15, 16, 21, and 22, T. 10 N., R. 8 W., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 16, Mich. 1915"	43 15 01.1	85 15 09.0	.....

IONIA QUADRANGLE.

Near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T road north	42 59 32.0	85 01 37.6	.....
T road north	42 59 07.3	85 01 48.9	2,637
T road south	42 58 58.4	85 02 48.5	4,523
T. 7 N., R. 6 W., quarter corner between secs. 17 and 18, center of T road east	42 59 40.9	85 03 16.8	4,785
Crossroads	42 59 54.2	85 08 57.2	.....

IONIA QUADRANGLE—Continued.

Near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 7 N., R. 8 W., quarter corner between secs. 15 and 22, center of crossroads	42 59 14.8	85 14 35.1	.....
T. 7 N., R. 8 W., corner of secs. 14, 15, 22, and 23, center of T road west	42 59 14.9	85 14 00.0	2,610
T. 7 N., R. 8 W., quarter corner between secs. 22 and 23, center of crossroads	42 58 48.8	85 14 00.4	2,646
T. 7 N., R. 8 W., quarter corner between secs. 26 and 27, center of crossroads	42 57 56.8	85 13 59.7	5,260
T. 7 N., R. 8 W., corner of secs. 26, 27, 34, and 35, center of crossroads	42 57 30.6	85 13 59.7	2,645
T. 7 N., R. 8 W., corner of secs. 34 and 35, 30 feet west is corner of secs. 2 and 3, T. 6 N., R. 8 W., crossroads	42 56 38.7	85 13 59.3	5,250
T. 7 N., R. 8 W., corner of secs. 35 and 36, center of T road north	42 56 38.6	85 12 48.2	5,290
Crossroads	42 56 18.2	85 12 49.1	2,062
T. 6 N., R. 8 W., corner of secs. 1, 2, 11, and 12, street crossing Saranac	42 55 46.4	85 12 48.2	3,209
T. 6 N., R. 8 W., corner of secs. 10, 11, 14, and 15, center of road fork	42 54 54.8	85 13 58.9	7,412
T. 6 N., R. 8 W., corner of secs. 14, 15, 22, and 23, center of crossroads	42 54 02.5	85 13 59.0	5,295
T. 6 N., R. 8 W., corner of secs. 22, 23, 26, and 27, center of crossroads	42 53 10.3	85 13 59.0	5,282
T. 6 N., R. 8 W., corner of secs. 26, 27, 34, and 35, center of crossroads	42 52 18.0	85 13 59.0	5,290
T. 5 N., R. 8 W., corner of secs. 2 and 3, 25 feet west is corner of secs. 34 and 35, T. 6 N., R. 8 W., center of T road west	42 51 25.6	85 13 58.7	5,304
T. 5 N., R. 8 W., corner of secs. 2, 3, 10, and 11, center of crossroads	42 50 31.6	85 13 57.9	5,466
Pere Marquette R. R. crossing	42 49 51.9	85 13 57.0	4,007
T. 5 N., R. 8 W., corner of secs. 10, 11, 14, and 15	42 49 39.1	85 13 56.8	1,293
T. 5 N., R. 8 W., quarter corner between secs. 22 and 23, center of crossroads	42 48 20.8	85 13 55.9	7,924
T. 5 N., R. 8 W., corner of secs. 26, 27, 34, and 35, center of crossroads	42 47 02.6	85 13 55.6	7,915
T. 4 N., R. 8 W., corner of secs. 2 and 3, 30 feet west, corner of secs. 34 and 35, T. 5 N., R. 8 E., center of crossroads	42 46 10.7	85 13 54.9	5,256
T. 4 N., R. 8 W., corner of secs. 2, 3, 10, and 11, center of T road north	42 45 19.4	85 13 54.0	5,188

Through center of quadrangle.

T. 6 N., R. 8 W., corner of secs. 25, 26, 35, and 36, center of crossroads	42 52 17.8	85 12 48.2	.....
T. 6 N., Rs. 7 and 8 W., corner of secs. 25, 30, 31, and 36, center of crossroads	42 52 18.0	85 11 37.0	5,296
T. 6 N., R. 7 W., corner of secs. 29, 30, 31, and 32, center of crossroads	42 52 17.9	85 10 25.6	5,316
T. 6 N., R. 7 W., corner of secs. 28, 29, 32, and 33, center of crossroads	42 52 17.8	85 09 14.1	5,319
Clarksville, 2 miles north and 5.5 miles east of, 25 feet south by 32 feet west, corner of secs. 27, 28, 33, and 34, T. 6 N., R. 7 W., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 28, Mich. 1915."	42 52 17.6	85 08 03.6	5,247
T. 6 N., R. 7 W., corner of secs. 26, 27, 34, and 35, center of crossroads	42 52 17.6	85 06 52.1	5,322
T. 6 N., R. 7 W., corner of secs. 25, 26, 35, and 36, center of crossroads	42 52 17.6	85 05 41.2	5,278
T. 6 N., Rs. 6 and 7 W., corner of secs. 25, 30, 31, and 36, center of crossroads	42 52 17.5	85 04 30.2	5,289
T. 6 N., R. 6 W., corner of secs. 29, 30, 31, and 32, center of crossroads	42 52 17.2	85 03 14.8	5,611
T. 6 N., R. 6 W., quarter corner between secs. 28 and 33, center of T road south	42 52 17.0	85 01 28.6	7,902
T. 6 N., R. 6 W., corner of secs. 27, 28, 33, and 34, center of crossroads	42 52 17.0	85 00 53.1	2,640

Near east border of quadrangle.

T. 7 N., R. 6 W., corner of secs. 27, 28, 33, and 34, fence line	42 57 29.8	85 00 54.6	.....
T. 7 N., R. 6 W., quarter corner between secs. 28 and 33, center of T road south	42 57 29.9	85 01 30.0	2,630
T. 7 N., R. 6 W., corner of secs. 28, 29, 32, and 33, center of T road north	42 57 30.0	85 02 05.3	2,627
T. 7 N., R. 6 W., quarter corner between secs. 29 and 32, center of T road east	42 57 30.2	85 02 40.7	2,633
Crossroads	42 58 19.7	85 02 48.3	5,044

Magnetic declination near north border of quadrangle, 0° 30′ W.; near west border, 0° 30′ W.; near east border, 0° 30′ W.; through center, 0° 30′ W.

ITHACA QUADRANGLE.

Near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 11 N., R. 4 W., corner of secs. 23, 24, 25, and 26, center of T road north	43 19 15.8	84 44 46.5	.....
T. 11 N., R. 4 W., corner of secs. 25, 26, 35, and 36, center of T road north	43 18 23.6	84 44 46.6	5,283
T. 10 N., R. 4 W., corner of secs. 1 and 2, center of T road south	43 17 31.4	84 44 15.9	5,752
Crossroads	43 16 51.4	84 44 16.1	4,050
T. 10 N., R. 4 W., corner of secs. 11, 12, 13, and 14, center of crossroads	43 15 46.0	84 44 16.2	6,620

Magnetic declination for west border of quadrangle, 1° 15′ W.

LOWELL QUADRANGLE.

Near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 7 N., R. 8 W., quarter corner between secs. 21 and 22, fence line	42 58 48.7	85 15 11.3	.....
T. 7 N., R. 8 W., quarter corner between secs. 20 and 21, center of crossroads	42 58 49.2	85 16 21.7	5,232
T. 7 N., R. 8 W., quarter corner between secs. 19 and 20, center of crossroads	42 58 49.4	85 17 33.3	5,318
T road north	42 59 01.3	85 18 44.2	5,403
Flat River, east end of covered bridge over	42 58 50.2	85 19 36.2	4,030
T road east	42 58 36.0	85 20 57.8	6,231
T. 7 N., R. 9 W., quarter corner between secs. 22 and 23, center of crossroads	42 58 49.2	85 21 06.8	1,494
T. 7 N., R. 9 W., corner of secs. 14, 15, 22, and 23, center of T road west	42 59 15.2	85 21 06.6	2,626
T. 7 N., R. 9 W., quarter corner between secs. 14 and 15, center of T road west	42 59 41.5	85 21 06.8	2,665
Pere Marquette R. R. crossing	42 59 41.3	85 21 33.6	1,990
T. 7 N., R. 9 W., quarter corner between secs. 15 and 16, center of crossroads	42 59 41.1	85 22 18.1	3,310

Through center of quadrangle.

Whitneyville, crossing Pere Marquette R. R	42 52 14.1	85 27 28.8	.....
T. 6 N., R. 10 W., corner of secs. 25, 26, 35, and 36, center of T road north	42 52 14.5	85 26 57.4	2,330
T. 6 N., Rs. 9 and 10 W., corner of secs. 25, 30, 31, and 36, center of crossroads	42 52 15.2	85 25 46.6	5,270
T. 6 N., R. 9 W., corner of secs. 29, 30, 31, and 32, center of crossroads	42 52 15.5	85 24 37.4	5,153
T. 6 N., R. 9 W., corner of secs. 28, 29, 32, and 33, center of crossroads	42 52 15.7	85 23 26.7	5,265
Alto, 1 mile north, by 0.5 mile east of, 41 feet west is corner of secs. 27, 28, 33, and 34, T. 6 N., R. 9 W., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 26, Mich. 1915."	42 52 15.7	85 22 16.4	5,233
Crossroads	42 52 16.5	85 20 46.8	6,669
T. 6 N., R. 9 W., corner of secs. 25, 26, 35, and 36, center of T road south	42 52 16.8	85 19 53.7	3,952
T. 6 N., R. 9 W., corner of secs. 25 and 36, center of T road north	42 52 17.3	85 18 42.1	5,325
T. 6 N., R. 8 W., corner of secs. 29, 30, 31, and 32, center of crossroads	42 52 17.0	85 17 31.9	5,227
T. 6 N., R. 8 W., corner of secs. 28, 29, 32, and 33, center of crossroads	42 52 17.5	85 16 21.3	5,254
T. 6 N., R. 8 W., quarter corner between secs. 28 and 33, center of T road south	42 52 17.7	85 15 45.9	2,636
Clarksville, 2 miles north and 0.5 mile west of, 24 feet south by 20 feet west is corner of secs. 27, 28, 33, and 34, T. 6 N., R. 8 W., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 27, Mich. 1915"	42 52 17.6	85 15 10.6	2,624

Magnetic declination near north border of quadrangle, 0° 15′ W.; through center, 0° 15′ W.

MOUNT PLEASANT QUADRANGLE.

Near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Mount Pleasant, 6 miles south of, 22 feet south by 20 feet west of corner of secs. 14, 15, 22, and 23, T. 13 N., R. 4 W., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 1, Mich. 1915".	43 31 26.2	84 46 02.5	.....
T. 13 N., R. 4 W., corner of secs. 2, 3, 10, and 11, center of crossroads	43 32 18.4	84 46 03.1	5,280
T. 13 N., R. 4 W., corner of secs. 2, 3, 34, and 35, center of crossroads	43 33 12.0	84 46 02.1	5,428
T. 14 N., R. 4 W., corner of secs. 26, 27, 34, and 35, center of T road west	43 34 04.6	84 46 02.2	5,330
Depuy station, Ann Arbor R. R crossing	43 34 11.0	84 46 02.3	640
T. 14 N., R. 4 W., corner of secs. 22, 23, 26, and 27, center of crossroads	43 34 57.0	84 46 02.7	4,660
T. 14 N., R. 4 W., corner of secs. 14, 15, 22, and 23, center of crossroads	43 35 49.5	84 46 03 1	5,320
Mount Pleasant, intersection of Main Street and State road	43 36 15.8	84 46 03.4	2,659
T. 14 N., R. 4 W., corner of secs. 10, 11, 14, and 15, center of crossroads	43 36 42.1	84 46 03.7	2,660
Mount Pleasant, 1 mile north of, crossing Pere Marquette R. R	43 37 10.1	84 46 04.4	2,840
Mount Pleasant, 1.5 miles north of, 1,100 feet north of bridge over Chippewa River; iron post stamped "Prim. Trav. Sta. No. 2, Mich. 1915"	43 37 39.0	84 46 08.5	2,943
Tps. 14 and 15 N., R. 4 W., corner of secs. 2, 3, 34, and 35, center of crossroads	43 38 25.7	84 46 05.0	4,728
T. 15 N., R. 4 W., corner of secs. 26, 27, 34, and 35, center of crossroads	43 39 16.8	84 46 04.8	5,180
T. 15 N., R. 4 W., corner of secs. 22, 23, 26, and 27, center of crossroads	43 40 08.8	84 46 04.0	5,260
T. 15 N., R. 4 W., corner of secs. 14, 15, 22, and 23, center of crossroads	43 41 00.6	84 46 03.4	5,250
Rosebush, at corner of secs. 10, 11, 14, and 15, T. 15 N., R. 4 W., center of crossroads	43 41 54.1	84 46 04.1	5,410
T. 15 N., R. 4 W., corner of secs. 2, 3, 10, and 11, center of crossroads	43 42 45.3	84 46 03.6	5,190
Tps. 15 and 16 N., R. 4 W., corner of secs. 2, 3, 34, and 35, center of crossroads	43 43 40.0	84 46 03.8	5,540
Mount Pleasant, 9 miles north of, 22 feet south by 20 feet east of corner secs. 26, 27, 34, and 35, T. 16 N., R. 4 W., center of T road east; iron post stamped "Prim. Trav. Sta. No. 3, Mich. 1915."	43 44 31.9	84 46 02.1	5,254

Near north border of quadrangle.

T. 16 N., R. 4 W., quarter corner between secs. 26 and 27, center of T road west	43 44 58.3	84 46 02.9	.....
Doherty station, Ann Arbor R. R. crossing	43 44 57.8	84 46 38.7	2,630
T. 16 N., R. 4 W., quarter corner between secs. 27 and 28, center of crossroads	43 44 57.3	84 47 14.9	2,660
T. 16 N., R. 4 W., quarter corner between secs. 28 and 29, center of T road south	43 44 56.9	84 48 26.3	5,240
T. 16 N., R. 4 W., quarter corner between secs. 29 and 30, center of T road east	43 44 56.6	84 49 37.7	5,240

Near west border of quadrangle.

T. 15 N., R. 6 W., center of sec. 13, center of T road south	43 41 24.7	84 58 40.9	7,871
T. 15 N., R. 6 W., quarter corner between secs. 13 and 24, center of crossroads	43 40 58.5	84 58 40.4	2,650
Pere Marquette R. R. crossing	43 40 05.7	84 58 39.8	5,350
T. 15 N., R. 6 W., center of sec. 25, T road west	43 39 40.6	84 58 39.9	2,540
T. 15 N., R. 6 W., quarter corner between secs. 25 and 26, center of T road south	43 39 40.6	84 59 15.3	2,610
T. 15 N., R. 6 W., corner of secs. 25, 26, 35, and 36, center of T road east	43 39 14.7	84 59 15.2	2,620
T. 15 N., R. 6 W., corner of secs. 35 and 36, 20 feet west is corner secs. 1 and 2, T. 14 N., R. 6 W., center of crossroads	43 38 22.7	84 59 15.2	5,270
Caldwell, 2 miles west of, 31 feet south by 24 feet east of corner of secs. 1, 2, 11, and 12, T. 14 N., R. 6 W., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 6, Mich. 1915."	43 37 30.1	84 59 14.6	5,322
T. 14 N., R. 6 W., corner of secs. 11, 12, 13 and 14, center of crossroads	43 36 38.5	84 59 14.3	5,230

MOUNT PLEASANT QUADRANGLE—Continued.

Near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 13 N., R. 6 W., corner of secs. 13, 14, 23, and 24, center of T road north	43 30 34.5	84 59 09.2	.....
T. 13 N., R. 6 W., corner of secs. 13 and 24, 30 feet north is corner of secs. 18 and 19, T. 13 N., R. 5 W., center of crossroads	43 30 34.3	84 57 56.8	5,340
T. 13 N., R. 5 W., corner of secs. 17, 18, 19, and 20, center of cross-roads	43 30 37.0	84 56 46.3	5,193
T. 13 N., R. 5 W., corner of secs. 16, 17, 20, and 21, center of cross-roads	43 30 37.3	84 55 32.9	5,410
T. 13 N., R. 5 W., corner of secs. 8, 9, 16, and 17, center of crossroads	43 31 30.2	84 55 33.7	5,360
T. 13 N., R. 5 W., quarter corner between secs. 9 and 16, center of crossroads	43 31 30.4	84 54 57.6	2,660
T. 13 N., R. 5 W., quarter corner between secs. 10 and 15, center of T road south	43 31 30.5	84 53 45.2	5,341
Winn, 1 mile south of, 32 feet north by 28 feet west, of corner of secs. 15 and 22, T. 13 N., R. 5 W., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 9, Mich. 1915."	43 30 37.7	84 53 45.0	5,348
T. 13 N., R. 5 W., corner of secs. 14, 15, 22, and 23, center of cross-roads	43 30 37.6	84 53 08.6	2,678
T. 13 N., R. 5 W., corner of secs. 13, 14, 23, and 24, center of cross-roads	43 30 37.6	84 51 55.8	5,370
T. 13 N., Rs. 4 and 5 W., corner of secs. 13, 18, 19, and 24, center of crossroads	43 30 33.9	84 50 48.7	4,955
T. 13 N., R. 4 W., corner of secs. 17, 18, 19, and 20, center of cross-roads	43 30 33.9	84 49 37.5	5,250
T. 13 N., R. 4 W., corner of secs. 16, 17, 20, and 21, center of cross-roads	43 30 33.4	84 48 26.0	5,269
T. 13 N., R. 4 W., corner of secs. 15, 16, 21, and 22, center of cross-roads	43 30 33.9	84 47 14.0	5,310

Through center of quadrangle.

T. 14 N., Rs. 5 and 6 W., corner of secs. 1, 6, 7, and 12, center of T road south	43 37 30.3	84 58 02.8	.....
T. 14 N., R. 5 W., corner of secs. 5, 6, 7, and 8, center of crossroads	43 37 30.3	84 56 53.0	5,137
Crossroad	43 37 35.8	84 55 41.0	5,326
Crossroad	43 37 36.0	84 54 28.7	5,320
Caldwell, 3 miles east of, 20 feet south by 25 feet west of, center of crossroad; iron post stamped "Prim. Trav. Sta. No. 7, Mich. 1915"	43 37 36.4	84 53 17.2	5,258
T. 14 N., R. 5 W., corner of secs. 1, 2, 11, and 12, center of T road south	43 37 31.7	84 52 03.1	5,469
T. 14 N., Rs. 4 and 5 W., corner of secs. 1, 6, 7, and 12, center of crossroads	43 37 31.8	84 50 54.0	5,090
T. 14 N., R. 4 W., corner of secs. 5, 6, 7, and 8, center of crossroads	43 37 32.8	84 49 40.9	5,375
T. 14 N., R. 4 W., corner of secs. 4, 5, 8, and 9, center of crossroads	43 37 33.2	84 48 28.5	5,329
T. 14 N., R. 4 W., corner of secs. 3, 4, 9, and 10, center of crossroads	43 37 34.0	84 47 16.6	5,289

Magnetic declination for east border of quadrangle, 1° 30′ W.; for north border, 1° 30′ W.; for west border, 1° 30′ W.; for south border, 1° 00′ W.; through center, 1° 15′ W.

REMUS QUADRANGLE.

Near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 16 N., R. 6 W., corner of secs. 26, 27, 34, and 35, center of cross-roads	43 44 27.5	85 00 24.2	.....
Tps. 15 and 16 N., R. 6 W., corner of secs. 2, 3, 34, and 35, center of crossroads	43 43 35.4	85 00 28.1	5,280
T. 15 N., R. 6 W., corner of secs. 10, 11, 14, and 15, center of cross-roads	43 41 50.9	85 00 28.5	10,574
T. 15 N., R. 6 W., quarter corner between secs. 14 and 15, center of crossroads	43 41 24.9	85 00 28.0	2,639
T. 14 N., R. 6 W., corner of secs. 10, 11, 14, and 15, center of cross-roads	43 36 38.2	85 00 25.0	.....
T. 14 N., R. 6 W., corner of secs. 14, 15, 22, and 23, center of cross-roads	43 35 46.4	85 00 24.2	5,239

REMUS QUADRANGLE—Continued.

Near east border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 14 N., R. 6 W., corner of secs. 22, 23, 26, and 27, center of cross-roads	43 34 54.4	85 00 23.5	5,270
T. 14 N., R. 6 W., corner of secs. 26, 27, 34, and 35, center of cross-roads	43 34 02.2	85 00 22.8	5,280
Tps. 13 and 14 N., R. 6 W., corner of secs. 2, 3, 34, and 35, center of T road north	43 33 10.1	85 00 22.1	5,278
T. 13 N., R. 6 W., corner of secs. 3 and 4, center of T road south	43 33 09.8	85 01 35.0	5,370
T. 13 N., R. 6 W., corner of secs. 3, 4, 9 and 10, center of crossroads	43 32 17.1	85 01 33.9	5,330
T. 13 N., R. 6 W., corner of secs. 9, 10, 15, and 16, center of cross-roads	43 31 25.5	85 01 32.8	5,230
Blanchard, 3 miles east of, 32 feet south by 26 feet west of corner of secs. 15, 16, 21, and 22, T. 13 N., R. 6 W., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 8, Mich. 1915"	43 30 33.4	85 01 32.4	5,273
T. 13 N., R. 6 W., corner of secs. 14, 15, 22, and 23, center of T road west	43 30 33.9	85 00 20.9	5,266

Magnetic declination for east border of quadrangle, 1° 30′ W.

SEARS QUADRANGLE.

Near southeast corner of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Brinton, 1 mile south of, 26 feet south by 26 feet east of corner of secs. 22, 23, 26, and 27, T. 16 N., R. 6 W., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 5, Mich. 1915"	43 45 19.3	85 00 29.6	.....

VESTABURG QUADRANGLE.

Near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 10 N., R. 5 W., quarter corner, east side sec. 13, 25 feet north is quarter corner, west side of sec. 18	43 15 23.1	84 50 08.3	.....
T. 10 N., R. 5 W., center of sec. 13, center of T road south	43 15 23.0	84 50 44.2	2,650
T. 10 N., R. 5 W., quarter corner between secs. 13 and 14, center of crossroads	43 15 23.1	84 51 20.0	2,650
Crystal, 2 miles east of, 17 feet north by 30 feet east of quarter corner between secs. 14 and 15, center of T road south; iron post stamped "Prim. Trav. Sta. No. 13, Mich. 1915"	43 15 23.5	84 52 31.5	5,290
T. 10 N., R. 5 W., quarter corner between secs. 15 and 16, center of crossroads	43 15 24.2	84 53 42.7	5,270
T. 10 N., R. 5 W., quarter corner between secs. 16 and 17, center of crossroads	43 15 24.6	84 54 54.2	5,290
Crystal, center of crossroads at	43 15 47.3	84 54 53.9	2,300
T. 10 N., R. 5 W., corner of secs. 7 and 18, center of T road east	43 15 51.1	84 57 17.3	10,615
T. 10 N., R. 6 W., corner of secs. 12, 13, 14, and 15, center of cross-roads	43 15 51.6	84 58 28.0	5,231

Near east border of quadrangle.

T. 13 N., R. 4 W., corner of secs. 22, 23, 26, and 27, center of T road west	43 29 42.1	84 46 01.9	.....
T. 13 N., R. 4 W., corner of secs. 26, 27, 34, and 35, center of T road west	43 28 50.4	84 46 01.5	5,236
T. 13 N., R. 4 W., corner of secs. 34 and 35, 30 feet east is corner secs. 2 and 3, T. 12 N., R. 4 W., center of crossroads	43 27 58.2	84 46 00.3	5,290
T. 12 N., R. 4 W., corner of secs. 2, 3, 10, and 11, center of cross-roads	43 27 06.1	84 45 59.6	5,278
T. 12 N., R. 4 W., corner of secs. 10, 11, 14, and 15, center of cross-roads	43 26 13.8	84 45 59.7	5,290

VESTABURG QUADRANGLE—Continued.

Near east border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 12 N., R. 4 W., corner of secs. 14, 15, 22, and 23, center of cross-roads	43 25 21.6	84 46 00.0	5,280
T. 12 N., R. 4 W., corner of secs. 22, 23, 26, and 27, center of cross-roads	43 24 29.4	84 45 59.9	5,290
T. 12 N., R. 4 W., corner of secs. 26, 27, 34, and 35	43 23 37.1	84 45 59.6	5,290
Pere Marquette R. R. crossing	43 23 11.0	84 45 59.5	2,650
Elwell, 1 mile west of, 27 feet north by 25 feet east of corner of secs. 34 and 35, 27 feet north by 15 feet east of corner of secs. 2 and 3, T. 11 N., R. 4 W., crossroads; iron post stamped "Prim. Trav. Sta. No. 10, Mich. 1915."	43 22 45.2	84 45 59.0	2,610
T. 11 N., R. 4 W., corner of secs. 2, 3, 10, and 11, center of crossroads	43 21 52.2	84 45 59.0	5,370
T. 11 N., R. 4 W., corner of secs. 10, 11, 14, and 15, center of cross-roads	43 21 00.0	84 45 58.8	5,280
T. 11 N., R. 4 W., corner of secs. 14, 15, 22, and 23, center of cross-roads	43 20 08.0	84 45 58.7	5,270
T. 11 N., R. 4 W., corner of secs. 22, 23, 26, and 27, center of T road north	43 19 15.7	84 45 58.8	5,290

Through center of quadrangle.

T. 11 N., R. 4 W., corner of secs. 3 and 4, 30 feet west, corner of secs. 33 and 34, T. 12 N., R. 4 W., crossroads	43 22 45.0	84 47 10.5	.....
T. 11 N., R. 4 W., corner of secs. 4 and 5, 20 feet west, corner of secs. 32 and 33, T. 12 N., R. 4 W., crossroads	43 22 44.9	84 48 22.2	5,300
T. 12 N., R. 4 W., corner of secs. 31 and 32, center of T road north	43 22 44.8	84 49 34.3	5,320
Riverdale, 0.5 mile south of; center of crossroads	43 22 44.7	84 50 09.1	2,570
Tps. 11 and 12 N., Rs. 4 and 5 W., corner of secs. 1, 6, 31, and 36, center of road south	43 22 44.7	84 50 42.1	2,440
T. 11 N., R. 5 W., corner of secs. 1 and 2, center of T road south	43 22 44.5	84 51 57.4	5,560
Vestaburg, 1 mile south by 1 mile west of, 25 feet south by 26 feet east of corner of secs. 2 and 3, T. 11 N., R. 5 W., center of T road south; iron post stamped "Prim. Trav. Sta. No. 11, Mich. 1915"	43 22 44.2	84 53 09.3	5,315
T. 12 N., R. 5 W., corner of secs. 33 and 34, center of T road north	43 22 44.6	84 54 17.3	5,016
T. 11 N., R. 5 W., corner of secs. 3 and 4, center of T road south	43 22 44.6	84 54 21.6	320
T. 12 N., R. 5 W., quarter corner, south side of sec. 33, center of T road north	43 22 44.6	84 54 53.1	2,330
T. 11 N., R. 5 W., quarter corner, north side of sec. 4, center of T road south	43 22 44.6	84 54 56.8	270
T. 11 N., R. 5 W., corner of secs. 5 and 6, center of T road south	43 22 44.9	84 56 43.6	7,890
Tps. 11 and 12 N., Rs. 5 and 6 W., corner of secs. 1, 6, 31, and 36, center of T road north	43 22 45.0	84 57 53.4	5,150
T. 11 N., R. 6 W., corner of secs. 1 and 2, center of T road south	43 22 45.0	84 59 06.3	5,390

Magnetic declination for south border of quadrangle, 1° 00′ W.; for east border, 1° 15′ W.; through center, 1° 15′ W.

Bay City, Burt, Carson City, Chesaning, Corunna, De Witt, Durand, Elsie, Fowlerville, Freland, Laingsburg, Merrill, Muir, Perrinton, St. Charles, Saginaw, and Vassar quadrangles.

CLINTON, EATON, GRATIOT, LIVINGSTON, MIDLAND, SAGINAW, AND SHIAWASSEE COUNTIES.

The following geographic positions were determined by primary traverse in 1913 and 1915 by J. H. Wilson, and are based on traverse positions determined in 1908 and 1909, described in Bulletins 440 and 496, on approximate North American datum.

Additional control for Muir, Bay City, Saginaw, and Vassar quadrangles was done by Oscar Jones in 1915.

BAY CITY QUADRANGLE.

Along highways near southwest corner of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Saginaw, 4.5 miles north of, 20 feet north by 20 feet east of corner of secs. 22, 23, 26, and 27, T. 13 N., R. 4 E., in northeast corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 12 Michigan 1913"	43 30 31.8	83 58 24.3	.....
T. 13 N., R. 4 E., corner of secs. 21, 22, 27, and 28; crossroads	43 30 30.4	83 59 40.1	5,590

Magnetic declination near southwest corner of quadrangle, 1° 54′ W.

Near south border of quadrangle.

T. 13 N., R. 4 E., corner of secs. 14, 15, 22, and 23, center of crossroads	43 31 23.8	83 58 29.4	.....
T. 13 N., R. 4. E., corner of secs. 13, 14, 23, and 24, center of crossroads	43 31 22.8	83 57 21.2	5,030
T. 13 N., Rs. 4 and 5 E., corner of secs. 13, 18, 19, and 24, center of roads	43 31 21.8	83 56 06.6	5,490

North through center of quadrangle west of Saginaw River.

T. 13 N., Rs. 4 and 5 E., corner of secs. 7, 12, 13, and 18, center of T road west	43 32 11.1	83 56 06.0	4,990
T. 13 N., Rs. 4 and 5 E., corner of secs. 1, 6, 7, and 12, center of T road west	43 33 04.8	83 56 04.8	5,440
Road fork at brick church	43 33 48.1	83 56 35.3	4,929
Tps. 13 and 14 N., Rs. 4 and 5 E., corner of secs. 1, 6, 31, and 36, center of T road north	43 33 57.6	83 56 02.9	2,563
Tps. 13 and 14 N., R. 5 E., corner of secs. 31 and 32, center of crossroads	43 33 57.0	83 54 59.4	4,680
T. 14 N., R. 5 E., corner of secs. 29, 30, 31, and 32, center of crossroads	43 34 49.1	83 54 58.0	5,280
T. 14 N., R. 5 E., corner of secs. 19, 20, 25, and 30, center of crossroads	43 35 41.2	83 54 56.8	5,280
Bay City, west side, intersection of West Midland Street and South Euclid Avenue	43 36 07.1	83 54 56.0	2,624
Bay City, west side, intersection, southwest curb line of South Walnut and East Midland streets	43 36 06.5	83 53 55.2	4,472
Bay City, west side, railroad crossing corner of State and Hart streets	43 36 45.8	83 53 43.1	4,086
Puddy's corners, center of crossroads	43 37 26.9	83 53 59.3	4,330
Crossroads	43 38 17.6	83 53 56.0	5,141
T road west	43 39 09.2	83 53 53.2	5,233
Tps. 14 and 15 N., R. 5 E., corner of secs. 5, 6, 31, and 32, center of crossroads	43 39 09.8	83 54 47.0	3,955
Tps. 14 and 15 N., Rs. 4 and 5 E., corner of secs. 1, 6, 31, and 36, center of crossroads	43 39 10.3	83 55 45.4	4,295
Michigan Central R. R. crossing	43 39 55.9	83 56 54.7	6,870
Do	43 40 55.3	83 57 04.0	6,058
Do	43 41 45.3	83 57 11.8	5,089
Do	43 42 35.3	83 57 19.6	5,100
Do	43 43 26.8	83 57 27.7	5,250
Linwood, Michigan Central R. R. crossing, 420 feet north of station	43 44 18.8	83 57 35.7	5,293
Tps. 15 and 16 N., R. 4 E., corner of secs. 2, 3, 34, and 35, center of T road north	43 44 19.1	83 58 07.7	2,349
Crossroads	43 44 19.3	83 58 37.1	2,160

Near west border of quadrangle.

Linwood, 2 miles west of, 27 feet south by 26 feet east of corner of secs. 3, 4, 33, and 34, T. 15 N., R. 4 E., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 20, Mich. 1915"	43 44 19.3	83 59 18.4	3,029
T. 15 N., R. 4 E., corner of secs. 3, 4, 9, and 10, center of crossroads	43 43 27.9	83 59 18.8	5,200
T. 15 N., R. 4 E., corner of secs. 9, 10, 15, and 16, center of crossroads	43 42 36.5	83 59 19.6	5,210
T. 15 N., R. 4 E., corner of secs. 15, 16, 21, and 22, center of T road west	43 41 45.2	83 59 21.0	5,190
T. 15 N., R. 4 E., corner of secs. 21, 22, 27, and 28, center of crossroads	43 40 53.9	83 59 22.0	5,195
T. 15 N., R. 4 E., corner of secs. 27, 28, 33, and 34, center of crossroads	43 40 02.3	83 59 23.1	5,230

BAY CITY QUADRANGLE—Continued.

Near west border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 15 N., R. 4 E., corner of secs. 33 and 34, center of T road north	43 39 11.2	83 59 24.4	5,170
T. 14 N., R. 4 E., corner of secs. 3, 4, 9, and 10, center of crossroads	43 38 19.6	83 59 28.6	5,231
Kawkawlin, 2 miles south and 2 miles west of, 20 feet south by 23 feet west of corner of secs. 9, 10, 15, and 16, T. 14 N., R. 4 E., center of T road west; iron post stamped "Prim. Trav. Sta. No. 21, Mich. 1915"	43 37 27.6	83 59 30.2	5,275
T. 14 N., R. 4 E., corner of secs. 15, 16, 21, and 22, center of T road west	43 36 36.6	83 59 31.9	5,168
T. 14 N., R. 4 E., quarter corner between secs. 21 and 22, center of crossroads	43 36 10.3	83 59 33.0	2,660
T. 14 N., R. 4 E., corner of secs. 27, 28, 33, and 34, center of crossroads	43 34 52.5	83 59 36.0	7,880
Tps. 13 and 14 N., R. 4 E., corner of secs. 3, 4, 33, and 34, center of T road north	43 34 00.5	83 59 38.8	5,208
T. 13 N., R. 4 E., corner of secs. 3, 4, 9, and 10, center of crossroads	43 33 08.3	83 59 41.8	5,296
T. 13 N., R. 4 E., corner of secs. 9, 10, 15, and 16, center of crossroads	43 32 15.5	83 59 42.9	5,340
T. 13 N., R. 4 E., corner of secs. 15, 16, 21, and 22, center of crossroads	43 31 23.8	83 59 41.7	5,240
T. 13 N., R. 4 E., corner of secs. 21, 22, 27, and 28, center of crossroads	43 30 30.6	83 59 40.2	5,390

North through center of quadrangle east of Saginaw River.

T. 13 N., R. 5 E., corner of secs. 23, 24, 25, and 26, center of crossroads	43 30 28.1	83 50 10.8	.....
T. 13 N., R. 5 E., corner of secs. 13, 14, 23, and 24, center of crossroads	43 31 19.9	83 50 12.4	5,250
T. 13 N., R. 5 E., corner of secs. 14, 15, 22, and 23, center of T road east	43 31 20.4	83 51 26.1	5,430
T. 13 N., R. 5 E., corner of secs. 10, 11, 14, and 15, center of crossroads	43 32 12.2	83 51 26.3	5,237
Michigan Ry. Co. electric line crossing	43 32 13.4	83 52 19.5	3,918
T. 13 N., R. 5 E., corner of secs. 9, 10, 15, and 16, center of T road east	43 32 13.4	83 52 36.1	1,220
T. 13 N., R. 5 E., corner of secs. 3, 4, 9, and 10, center of crossroads	43 33 05.3	83 52 34.4	5,260
T. 14 N., R. 5 E., corner of secs. 33 and 34, center of crossroads	43 33 56.5	83 52 35.8	5,182
Bay City, T. 14 N., R. 5 E., corner of secs. 27, 28, 33, and 34, corner of Lincoln street and Kosciuszka Avenue	43 34 48.3	83 52 37.2	5,240
Bay City, southwest corner, curb line, Third and North Lincoln streets	43 36 00.1	83 52 33.7	7,276
Bay City, southeast corner, curb line, Third and Washington streets, U. S. post office	43 36 03.4	83 53 15.6	3,094

Near north border of quadrangle.

Bay City, northeast corner, curb line, Central and Park avenues	43 35 45.8	83 51 45.6	.....
Hotel Holland, crossroad at	43 35 41.0	83 50 51.5	4,008
T. 14 N., R. 5 E., quarter corner between secs. 14 and 23, center of crossroads	43 36 12.7	83 50 31.6	3,530
T. 14 N., R. 5 E., corner of secs. 14, 15, 23, and 24, center of crossroads	43 36 31.0	83 50 15.1	2,212
Essexville, quarter corner between secs. 14 and 15, T. 14 N., R. 5 E., center of crossroads	43 36 57.1	83 50 14.8	2,640
T. 14 N., Rs. 5 and 6 E., quarter corner between secs. 15 and 18, center of crossroads	43 36 56.2	83 49 01.0	5,429
T. 14 N., R. 6 E., quarter corner between secs. 17 and 18, center of crossroads	43 36 56.9	83 48 00.0	4,489
T. 14 N., R. 6 E., quarter corner between secs. 16 and 17, center of crossroads	43 36 56.9	83 46 48.6	5,250
Essexville, 4 miles east of, 29 feet north by 11 feet east of quarter corner between secs. 15 and 16, T. 14 N., R. 6 E., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 22, Mich. 1915."	43 36 57.8	83 45 36.9	5,270

Near east border of quadrangle.

T. 14 N., R. 6 E., corner of secs. 15, 16, 21, and 22, center of crossroads	43 36 31.5	83 45 36.8	2,670
Farleigh station, railroad crossing	43 35 26.3	83 45 35.9	6,600
T. 14 N., R. 6 E., corner of secs. 27, 28, 33, and 34, center of crossroads	43 34 47.3	83 45 35.5	3,950
T. 14 N., R. 6 E., corner of secs. 33 and 34, center of T road north	43 33 55.0	83 45 35.2	5,300

BAY CITY QUADRANGLE—Continued.

Near east border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 13 N., R. 6 E., corner of secs. 3, 4, 9, and 10, center of crossroads	43 33 03.0	83 45 33.2	5,259
T. 13 N., R. 6 E., corner of secs. 9, 10, 15, and 16, center of crossroads	43 32 11.0	83 45 33.1	5,270
T. 13 N., R. 6 E., corner of secs. 15, 16, 21, and 22, center of crossroads	43 31 18.8	83 45 32.3	5,280
T. 13 N., R. 6 E., corner of secs. 21, 22, 27, and 28, center of crossroads	43 30 27.0	83 45 32.3	5,250

Magnetic declination near south border of quadrangle, 2° 00′ W.; through center (west side of Saginaw River), 2° 00′ W.; through center (east side of Saginaw River), 2° 00′ W.; near north border, 2° 00′ W.; near west border, 2° 15′ W.; near east border, 2° 15′ W.

BURT QUADRANGLE.

Along highways near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 10 N., R. 4 E., 1 mile east of corner of secs. 28, 29, 32, and 33; west end of bridge over creek	43 14 04.3	83 59 32.1	.....
T. 10 N., R. 4 E., corner of secs. 26, 27, 34, and 35; crossroads at District No. 2 schoolhouse	43 14 04.6	83 58 18.2	5,472
T. 10 N., R. 4 E., 35 feet south by 25 feet east of corner of secs. 22, 23, 26, and 27, in southeast corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 10 Michigan 1913"	43 14 56.4	83 58 18.2	5,244
T. 9 N., R. 4 E., north corner of secs. 3 and 4; just west of bridge	43 13 11.9	83 59 27.7	.....
T. 9 N., R. 4 E., corner of secs. 3, 4, 9, and 10; stone in crossroads at schoolhouse	43 12 16.2	83 59 24.4	5,641
T. 9 N., R. 4 E., corner of secs. 9, 10, 15, and 16; crossroads	43 11 24.3	83 59 22.6	5,259
T. 9 N., R. 4 E., corner of secs. 15, 16, 21, and 22; crossroads at Layton Corners	43 10 32.2	83 59 21.2	5,270
T. 9 N., R. 4 E., corner of secs. 21, 22, 27, and 28; crossroads at St. Michaels Church and school	43 09 40.1	83 59 20.3	5,280
T. 9 N., R. 4 E., corner of secs. 27, 28, 33, and 34; crossroads at schoolhouse	43 08 48.0	83 59 18.6	5,270
T. 9 N., R. 4 E., south corner of secs. 33 and 34; stone, 10 feet west of center of crossroads	43 07 55.9	83 59 17.8	5,280
(30 feet east of above position is T. 8 N., R. 4 E., north corner of secs. 3 and 4, Saginaw-Shiwassee county line.)			
New Lothrop, 1 mile west of, 30 feet south by 25 feet west of corner of secs. 3, 4, 9, and 10, T. 8 N., R. 4 E., at schoolhouse in southwest corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 17 Michigan 1913"	43 06 59.9	83 59 17.4	5,669
T. 8 N., R. 4 E., stone at corner of secs, 9, 10, 15, and 16; crossroads	43 06 07.6	83 59 15.9	5,295
T. 8 N., R. 4 E., corner of secs. 15, 16, 21, and 22; crossroads at schoolhouse	43 05 15.5	83 59 16.4	5,280
T. 8 N., R. 4 E., corner of secs. 21, 22, 27, and 28; center of crossroads	43 04 23.2	83 59 15.9	5,290
T. 8 N., R. 4 E., corner of secs. 27, 28, 33, and 34; crossroads at Judville	43 03 31.1	83 59 15.6	5,280
Tps. 7 and 8 N., R. 4 E., corner of secs. 3, 4, 33, and 34; T road west	43 02 39.0	83 59 14.8	5,270
T. 7 N., R. 4 E., corner of secs. 3, 4, 9, and 10; T road east of District No. 8 schoolhouse	43 01 41.8	83 59 14.3	5,790
T. 7 N., R. 4 E., corner of secs. 9, 10, 15, and 16; T road east	43 00 50.2	83 59 14.2	5,230

Along highways near north border of quadrangle.

T. 10 N., R. 4 E., corner of secs. 23, 24, 25, and 26; crossroads	43 14 56.8	83 57 09.3	5,104
T. 10 N., R. 4 E., east corner of secs. 24 and 25; T road west	43 14 56.8	83 55 57.3	5,322
(450 feet north of above corner is west corner of secs. 19 and 30, T road east.)			
T. 10 N., R. 5 E., corner of secs. 20, 21, 28, and 29; crossroads	43 14 58.9	83 53 40.0	.....
T. 10 N., R. 5 E., stone at corner of secs. 21, 22, 27, and 28; T road west	43 14 59.2	83 52 28.5	5,295
T. 10 N., R. 5 E., 20 feet south and 25 feet west of corner of secs. 22, 23, 26, and 27; iron post set at southwest corner of crossroads, stamped "Prim. Trav. Sta. No. 11, 1915, Mich."	43 14 59.7	83 51 16.3	5,346
T. 10 N., R. 6 E., corner of secs. 19, 20, 29, and 30, just west of railroad crossing at Birch Run; T road south	43 15 00.1	83 47 40.1	.....

Magnetic declination for north border of quadrangle, 2° 10′ W.; for west border, 2° 14′ W.

CARSON CITY QUADRANGLE.

Along highways near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 8 N., R. 4 W., corner of secs. 22, 23, 26, and 27; crossroads	43 03 41.0	84 45 33.7	.....
T. 8 N., R. 4 W., corner of secs. 14, 15, 22, and 23; stone	43 04 33.4	84 45 33.3	5,300
Maple River, south end of bridge over, T. 8 N., R. 4 W., 470 feet southwest of corner of secs. 10, 11, 14, and 15	43 05 21.5	84 45 35.1	4,868
T. 8 N., R. 4 W., corner of secs. 10, 11, 14, and 15	43 05 25.7	84 45 32.3	479

Magnetic declination near east border of quadrangle, 0° 54′ W.

Near north border of quadrangle.

T. 10 N., R. 4 W., corner of secs. 14, 15, 22, and 23, center of crossroads	43 14 54.5	84 45 27.7	.....
T. 10 N., R. 4 W., corner of secs. 15, 16, 21, and 22, center of crossroads	43 14 55.1	84 46 39.3	5,300
T. 10 N., R. 4 W., corner of secs. 16, 17, 20, and 21, center of crossroads	43 14 55.9	84 47 50.1	5,240
T. 10 N., R. 4 W., corner of secs. 17, 18, 19, and 20, center of crossroads	43 14 56.2	84 49 01.2	5,260
T. 10 N., R. 4 W., corner of secs. 18 and 19, center of T road east	43 14 57.5	84 50 08.6	4,989
T. 10 N., R. 6 W., corner of secs. 13, 14, 23, and 24, center of T road north	43 14 59.5	84 58 28.3	.....
Crystal, 3.5 miles west by 1 mile south of, 16 feet south by 21 feet west of quarter corner between secs. 14 and 23, T. 10 N., R. 6 W., center of crossroad; iron post stamped "Prim. Trav. Sta. No. 14, Mich. 1915."	43 14 59.0	84 59 04.0	2,644

Near west border of quadrangle.

T. 7 N., R. 6 W., corner of secs. 2, 3, 10, and 11, center of crossroads	43 00 59.0	84 59 43.5	.....
T. 7 N., R. 6 W., corner of secs. 2 and 3, 100 feet west is corner of secs. 34 and 35, T. 8 N., R. 6 W., center of crossroads	43 01 57.4	84 59 43.5	5,917
T. 8 N., R. 6 W., corner of secs. 22, 23, 26, and 27, center of crossroads	43 03 41.8	84 59 44.5	10,570
Crossroads	43 04 44.9	84 59 43.7	6,382
T. 8 N., R. 6 W., quarter corner between secs. 11 and 14, center of T road west	43 05 26.5	84 59 07.6	4,995
Tps. 8 and 9 N., R. 6 W., quarter corner between secs. 2 and 35, center of T road west	43 07 11.3	84 59 08.0	.....
T road east	43 07 50.3	84 59 07.9	3,950
T. 9 N., R. 6 W., quarter corner between secs. 26 and 35, center of T road west	43 08 03.3	84 59 08.0	1,320
T road south	43 08 54.7	84 59 08.9	5,207
T. 9 N., R. 6 W., quarter corner between secs. 24 and 25, center of crossroads	43 08 55.5	84 57 57.9	5,266
T. 9 N., R. 6 W., quarter corner between secs. 13 and 24, center of crossroads	43 09 47.5	84 57 57.5	5,270
T. 9 N., R. 6 W., quarter corner between secs. 12 and 13	43 10 39.5	84 57 56.0	5,259
Vickeryville crossing Grand Trunk R. R.	43 11 05.5	84 57 55.7	2,634
T. 9 N., R. 6 W., quarter corner between secs. 1 and 2	43 11 31.5	84 57 55.3	2,636
T. 9 N., R. 6 W., corner of secs. 1, 2, 11, and 12, center of T road north	43 11 31.4	84 58 31.3	2,660
T. 9 N., R. 6 W., center of sec. 2, center of T road west	43 11 57.1	84 59 07.1	3,710
Tps. 9 and 10 N., R. 6 W., quarter corner between secs. 2 and 35, center of crossroads	43 12 22.8	84 59 06.6	2,610
T. 10 N., R. 6 W., quarter corner between secs. 26 and 35; center of T road west	43 13 14.8	84 59 04.8	5,264
T. 10 N., R. 6 W., quarter corner between secs. 23 and 26, center of crossroads	43 14 07.4	84 59 04.0	5,321

Near south border of quadrangle.

T. 7 N., R. 4 W., corner of secs. 10, 11, 14, and 15, center of crossroads	43 00 06.4	84 45 34.1	.....
T. 7 N., R. 4 W., corner of secs. 9, 10, 15, and 16, center of crossroads	43 00 06.7	84 46 45.3	5,290
T. 7 N., R. 4 W., corner of secs. 8, 9, 16, and 17, center of crossroads	43 00 06.8	84 47 56.6	5,300
T. 7 N., R. 4 W., corner of secs. 7, 8, 17, and 18, center of crossroads	43 00 06.8	84 49 07.7	5,280
T. 7 N., R. 4 W., corner of secs. 7 and 18	43 00 05.7	84 50 15.0	5,000
Pewamo, crossroads at	43 00 04.1	84 50 50.6	2,645
T. 7 N., R. 5 W., corner of secs. 11, 12, 13, and 14, center of crossroads	43 00 06.2	84 51.26.2	2,650

CARSON CITY QUADRANGLE—Continued.

Near south border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Pewamo, 1 mile west of, 27 feet north by 22 feet west of quarter corner between secs. 11 and 14, T. 7 N., R. 5 W., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 21, Mich. 1915"	43 00 06.7	84 52 01.9	2,652
T. 7 N., R. 5 W., corner of secs. 10, 11, 14, and 15, fence line	43 00 06.5	84 52 37.0	2,608
Grand Trunk R. R. crossing	43 00 01.6	84 53 50.5	5,480
T. 7 N., R. 5 W., corner of secs. 7 and 18, 90 feet north is corner of secs. 12 and 13, T. 7 N., R. 6 W., center of T road west	43 00 05.6	84 57 22.5	15,758
T. 7 N., R. 6 W., corner of secs. 11, 12, 13, and 14, center of crossroads	43 00 06.4	84 58 32.8	5,221
Ionia, 3 miles east by 1 mile north of, 30 feet south by 32 feet east of corner of secs. 10, 11, 14, and 15, T. 7 N., R. 6 W., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 22, Mich. 1915"	43 00 06.3	84 59 43.1	5,221

Through center of quadrangle.

Palo, 25 feet north by 32 feet east, center of sec. 2, T. 8 N., R. 6 W., center of crossroads; iron post stamped "Prim. Trva. Sta. No. 19, Mich. 1915"	43 06 44.9	84 59 07.1	.....
T. 8 N., R. 6 W., center of sec. 1, center of T road north	43 06 44.6	84 57 56.5	5,238
Tps. 8 and 9 N., Rs. 5 and 6 W., corner of secs. 1, 6, 31, and 36, center of T road east	43 07 10.5	84 57 20.8	3,724
T. 9 N., R. 5 W., corner of secs. 31 and 32, 50 feet east, corner of secs. 5 and 6, T. 8 N., R. 5 W., center of crossroads	43 07 10.0	84 56 09.1	5,320
T. 9 N., R. 5 W., corner of secs. 32 and 33, center of T road north	43 07 09.6	84 54 57.9	5,280
T. 9 N., R. 5 W., corner of secs. 33 and 34, center of crossroads	43 07 09.1	84 53 46.7	5,280
Hubbardston, 2 miles north by 2 miles east of, 25 feet south, is corner of secs. 34 and 35, T. 9 N., R. 5 W., center of T road west, 25 feet south by 40 feet west, is corner of secs. 2 and 3, T. 8 N., R. 5 W.; iron post stamped "Prim. Trav. Sta. No. 20, Mich. 1915"	43 07 08.5	84 52 35.5	5,276
Tps. 8 and 9 N., Rs. 4 and 5 W., corner of secs. 1, 6, 31, and 36, center of crossroads	43 07 07.7	84 50 13.0	10,565
T. 9 N., R. 4 W., corner of secs. 31 and 32, center of T road north	43 07 07.3	84 49 06.4	4,940
T. 9 N., R. 4 W., corner of secs. 32 and 33, center of T road north	43 07 06.8	84 47 54.9	5,300
T. 8 N., R. 4 W., corner of secs. 3 and 4, center of T road south	43 07 06.4	84 46 44.5	5,220
T. 9 N., R. 4 W., corner of secs. 33 and 34, center of T road north	43 07 06.4	84 46 43.5	70
Tps. 8 and 9 N., R. 4 W., corner of secs. 2, 3, 34, and 35, center of crossroads	43 07 06.0	84 45 32.2	5,290

Magnetic declination near north border of quadrangle, 1° 00′ W.; near west border, 0° 30′ W.; near south border, 0° 30′ W.; through center, 0° 15′ W.; near east border, 0° 54′ W.

CHESANING QUADRANGLE.

Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Brant, 1 mile south by 1 mile west of, 100 feet north by 30 feet west of bridge over Bad River, in northwest corner of road forks; iron post stamped "Prim. Trav. Sta. No. 8 Michigan, 1913"	43 14 42.5	84 14 56.3	.....
T. 10 N., R. 2 E., corner of secs. 20, 21, 28, and 29	43 14 39.6	84 14 55.9	302
Brant, 1 mile south of, corner of secs. 21, 22, 27, and 28, T. 10 N., R. 2 E.; crossroads at schoolhouse	43 14 40.3	84 13 44.8	5,262
T. 10 N., R. 2 E., corner of secs. 22, 23, 26, and 27; crossroads	43 14 40.7	84 12 34.0	5,240
T. 10 N., R. 2 E., corner of secs. 23, 24, 25, and 26	43 14 39.3	84 11 23.0	5,260
T. 10 N., R. 2 E., east corner of secs. 24 and 25; T road west (110 feet north of above position is T. 10 N., R. 3 E., west corner of secs. 19 and 30; T road east.)	43 14 39.0	84 10 10.5	5,365
T. 10 N., R. 3 E., corner of secs. 19, 20, 29, and 30; T road south	43 14 47.0	84 08 56.8	5,519
Fergus, 0.5 mile south of, 150 feet west of railroad crossing, 20 feet south by 15 feet east of corner of secs. 20, 21, 28, and 29, T. 10 N., R. 3 W., at southeast corner of T road south; iron post stamped "Prim. Trav. Sta. No. 9, Michigan, 1913"	43 14 48.1	84 07 46.0	5,241
T. 10 N., R. 3 E., corner of secs. 28, 29, 32, and 33; crossroads	43 13 52.8	84 07 44.8	5,600
Chesaning, 2 miles north of, at District No. 4 schoolhouse; T road east	43 13 02.2	84 06 56.9	6,227
T. 9 N., R. 3 E., north corner of secs. 3 and 4 (140 feet east of above position is south corner of secs. 33 and 34, T road north).	43 13 02.9	84 06 37.6	1,429

CHESANING QUADRANGLE—Continued.

Along highways near north border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Shiawassee River, west end of bridge over	14 13 03.5	84 06 19.1	1,370
T. 10 N., R. 3 E., south corner of secs. 34 and 35; T road north	43 13 05.4	84 05 25.7	3,960
(75 feet west of above position is north corner of secs. 2 and 3, T. 9 N., R. 3 E.; T road south).			
T. 10 N., R. 3 E., corner of secs. 26, 27, 34, and 35	43 13 59.0	84 05 27.4	5,430
T. 10 N., R. 3 E., corner of secs. 25, 26, 35, and 36; crossroads at schoolhouse	43 14 02.5	84 04 13.1	5,511
T. 10 N., R. 3 E., east corner of secs. 25 and 36; T road west at Luce post-office	43 14 02.0	84 03 04.1	5,110
(60 feet north is west corner of secs. 30 and 31, T road east.)			
T. 10 N. R. 4 E., corner of secs. 29, 30, 31, and 32; crossroads	43 14 02.7	84 01 52.3	5,319
T. 10 N., R. 4 E., corner of secs. 28, 29, 32, and 33; T road south	43 14 03.3	84 00 40.9	5,280
T. 10 N., R. 2 E., corner of secs. 28, 29, 32, and 33; crossroads	43 13 47.6	84 14 55.2	.....

Along highways near west border of quadrangle.

T. 7 N., R. 2 E., corner of secs. 9, 10, 15, and 16; crossroads	43 00 44.5	84 13 33.1	.....
T. 7 N., R. 2 E., corner of secs. 8, 9, 16, and 17; crossroads	43 00 50.8	84 14 41.6	5,124
T. 7 N., R. 2 E., corner of secs. 4, 5, 8, and 9; crossroads	43 01 43.2	84 14 41.9	5,305
T. 7 N., R. 2 E., north corner of secs. 4 and 5	43 02 32.9	84 14 41.5	5,030
(180 feet west of above corner is south corner of secs. 32 and 33 T. 8 N., R. 2 E., T road north)			
T. 8 N., R. 2 E., corner of secs. 28, 29, 32, and 33; crossroads	43 03 24.9	84 14 46.1	5,280
T. 8 N., R. 2 E., corner of secs. 20, 21, 28, and 29; crossroads	43 04 17.7	84 14 45.4	5,340
T. 8 N., R. 2 E., corner of secs. 16, 17, 20, and 21; crossroads	43 05 10.1	84 14 44.8	5,310
T. 8 N., R. 2 E., corner of secs. 8, 9, 16, and 17; crossroads	43 06 03.0	84 14 44.4	5,360
T. 8 N., R. 2 E., 25 feet south and 15 feet west of corner of secs. 4, 5, 8, and 9, at southwest corner of crossroads; iron post stamped "Prim. Trav. Sta. 8, 1915, Mich."	43 06 55.2	84 14 45.5	5,284
T. 8 N., R. 2 E., north corner of secs. 4 and 5, T road south, on Saginaw-Shiawassee county line	43 07 43.5	84 14 46.3	4,890
(150 feet west of above corner is south corner of secs. 32 and 33, T. 9 N., R. 2 E., T road north.)			
T. 9 N., R. 2 E., corner of secs. 28, 29, 32, and 33; T road east	43 08 35.8	84 14 48.9	5,297
T. 9 N., R. 2 E., corner of secs. 20, 21, 28, and 29; crossroads	43 09 28.0	84 14 50.5	5,291
T. 9 N., R. 2 E., corner of secs. 16, 17, 20, and 21; crossroads	43 10 17.5	84 14 51.3	5,010
T. 9 N., R. 2 E., corner of secs. 8, 9, 16, and 17; crossroads	43 11 12.6	84 14 52.0	5,580
T. 9 N., R. 2 E., corner of secs. 4, 5, 8, and 9; crossroads	43 12 04.9	84 14 52.8	5,300
T. 9 N., R. 2 E., north corner of secs. 4 and 5	43 12 54.3	84 14 53.6	4,998
(40 feet west of above corner is south corner of secs. 32 and 33, T. 10 N., R. 2 E., crossroads)			
T. 10 N., R. 2 E., corner of secs. 28, 29, 32, and 33; crossroads	43 13 47.6	84 14 55.2	5,400
Brant, 1 mile south and 1 mile west of, 100 feet north and 30 feet west of bridge over Bad River, in northwest corner of road forks; iron post stamped "Prim. Trav. Sta. No. 8, 1913, Mich."	43 14 42.50	84 14 56.30	5,558

Along highways through center of quadrangle.

T. 9 N., R .2 E., south corner of secs. 33 and 34; T road north	43 07 43.2	84 13 37.8	.....
(120 feet east of above corner is north corner of secs. 3 and 4, T. 8 N., R. 2 E., T road south on Saginaw-Shiawassee county line.)			
T. 9 N., R. 2 E., south corner of secs. 34 and 35; T road north	43 07 42.9	84 12 27.2	5,230
(140 feet east of above corner is north corner of secs. 2 and 3, T. 8 N., R. 2 E., at T road south.)			
T. 8 N., R. 2 E., north corner of secs. 1 and 2; T road south	43 07 42.9	84 11 19.3	5,040
(210 feet east of above corner is south corner of secs. 35 and 36, T. 9 N., R. 2 E., T road north.)			
Oakley, 1 mile south of, corner of Tps. 8 and 9 N., Rs. 2 and 3 E.; crossroads	43 07 42.7	84 10 05.7	5,460
T. 8 N., R. 3 E., stone at corner of secs. 5 and 6; T road south	43 07 44.5	84 08 55.4	5,211
(150 feet east of above corner is south corner of secs. 31 and 32, T road north.)			
T. 9 N., R. 3 E., south corner of secs. 32 and 33; center of east-west road	43 07 46.2	84 07 44.6	5,261
T. 8 N., R. 3 E., 15 feet south and 25 feet east of north corner of secs. 3 and 4, 15 feet south and 230 feet east of south corner of secs. 33 and 34, T. 9 N., R. 3 E., at southeast corner of T road south; iron post stamped "Prim. Trav. Sta. No. 10, 1915, Mich." Is on the Saginaw-Shiawassee county line road	43 07 48.0	84 06 30.8	5,470
T. 8 N., R. 3 E., north corner of secs. 2 and 3	43 07 49.9	84 05 21.7	5,130
(110 feet west of above corner is south corner of secs. 34 and 35, T. 9 N., R. 3 E., T road north at Saginaw-Shiawassee county line.)			

CHESANING QUADRANGLE—Continued.

Along highways through center of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 8 N., R. 3 E., quarter corner between secs. 2 and 3; crossroads	43 07 22.1	84 05 21.5	2,820
T. 8 N., R. 3 E., corner of secs. 2, 3, 10, and 11, 690 feet north of crossroads	43 06 56.1	84 05 18.9	2,640
T. 8 N., R. 3 E., 310 feet south of apparent corner of secs. 1, 2, 11, and 12; crossroads	43 06 53.7	84 04 09.2	5,169
T. 8 N., Rs. 3 and 4 E., between secs. 7 and 12; T road north	43 06 51.1	84 03 01.7	5,020
T. 8 N., R. 4 E., corner of secs. 5, 6, 7, and 8, crossroads at schoolhouse	43 06 59.3	84 01 39.9	6,125
T. 8 N., R. 4 E., corner of secs. 4, 5, 8, and 9; crossroads	43 06 59.5	84 00 27.5	5,370

Magnetic declination for north border of quadrangle, 1° 22′ W.; for south border, 1° 55′ W.; for east border, 2° 14′ W.; for west border, 2° 05′ W.; through center, 2° 15′ W.

CORUNNA QUADRANGLE.

Along highways near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Bancroft, 3 miles east of, in T. 6 N., R. 4 E., 30 feet south by 25 feet west of corner of secs. 28, 29, 32, and 33, in southwest corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 19 Michigan 1913"	42 52 52.8	84 00 24.8	.....
T. 6 N., R. 4 E., south corner of secs. 32 and 33, T road north	42 52 00.7	84 00 23.0	5,270
(35 feet east of above position is north corner of secs. 4 and 5, T. 5 N., R. 4 E.)			
T. 6 N., R. 4 E., south corner of secs. 32 and 33, 0.8 mile west of; T road east	42 52 00.0	84 01 16.4	3,981
Shiawassee River, north end of bridge over	42 50 57.9	84 01 25.8	6,318
Shiawassee River bridge, 0.8 mile southeast of; on quarter section line; T road south	42 50 28.0	84 00 50.7	4,009
Union Plains District No. 7 schoolhouse; T road north	42 49 47.3	84 00 48.9	4,120
T. 5 N., R. 4 E., corner of secs. 17, 18, 19, and 20; crossroads	42 49 20.6	84 01 23.2	3,722
T. 5 N., R. 4 E., corner of secs. 19, 20, 29, and 30; crossroads at schoolhouse	42 48 28.2	84 01 21.0	5,300
T. 5 N., R. 4 E., corner of secs. 29, 30, 31, and 32; crossroads	42 47 35.8	84 01 18.8	5,311
T. 5 N., R. 4 E., south corner of secs. 31 and 32; T road north (Shiawassee-Livingston county line)	42 46 43.5	84 01 16.9	5,301
(265 feet east of above corner is north corner of secs. 5 and 6, T. 4 N., R. 4 E., T road south.)			
Tps. 4 and 5 N., Rs. 3 and 4 E., corner of; T road south, county line	42 46 42.4	84 02 22.8	4,911
T. 4 N., R. 4 E., west corner of secs. 6 and 7	42 45 28.3	84 02 19.2	7,500

Magnetic declination near east border of quadrangle, 1° 58′ W.

Along highways near north border of quadrangle.

	° ′ ″	° ′ ″	*Feet.*
T. 7 N., R. 2 E., 20 feet north and 10 feet west of corner of secs. 16, 17, 20, and 21, on north side of east and west road at T road south; iron post stamped "Prim. Trav. Sta. No. 6, 1915, Mich."	42 59 58.6	84 14 42.0	.....
Five Corners, T. 7 N., R. 2 E., corner of secs. 15, 16, 21, and 22; at schoolhouse	42 59 51.8	84 13 33.1	5,163
T. 7 N., R. 2 E., corner of secs. 14, 15, 22, and 23; crossroads at schoolhouse	42 59 51.2	84 12 23.2	5,194
Owosso, T. 7 N., R. 2 E., corner of secs. 13, 14, 23, and 24, intersection of Chipman and Main streets	42 59 51.7	84 11 11.7	5,320
Owosso, intersection of Main and North Hickory streets, at corner of secs. 13, 24, 18, and 19, T. 7 N., Rs. 2 and 3 W	42 59 50.8	84 10 01.3	5,230
T. 7 N., R. 3 E., corner of secs. 17, 18, 19, and 20; T road north	42 59 51.7	84 08 53.4	5,050
T. 7 N., R. 3 E., corner of secs. 16, 17, 20, and 21; center of east and west road	42 59 53.3	84 07 44.6	5,120
T. 7 N., R. 3 E., 20 feet north and 45 feet east of quarter corner between secs. 16 and 21, at northeast corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 7, 1915, Mich."	42 59 54.5	84 07 08.0	2,720
T. 7 N., R. 3 E., corner of secs. 15, 16, 21, and 22; center of east and west road	42 59 55.1	84 06 33.2	2,590

CORUNNA QUADRANGLE—Continued.

Along highways near north border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 7 N., R. 3 E., corner of secs. 14, 15, 22, and 23; center of east and west road	42 59 55.8	84 05 22.8	5,230
T. 7 N., R. 3 E., corner of secs. 13, 14, 23, and 24; crossroads at schoolhouse	42 59 57.4	84 04 09.9	5,421
T lane (unimproved) west, north and south township line	42 59 45.1	84 03 00.4	5,318
T. 7 N., R. 4 E., corner of secs. 17, 18, 19, and 20; crossroads just east of Venice school	42 59 57.2	84 01 37.5	6,279
T. 7 N., R. 4 E., corner of secs. 16, 17, 20, and 21; crossroads	42 59 56.9	84 00 25.4	5,360

Magnetic declination for north border of quadrangle, 1° 55′ W.; near east border, 1° 58′ W.

DE WITT QUADRANGLE.

Along highways near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 5 N., R. 4 W., corner of secs. 25, 26, 35, and 36; T road west	42 47 04.9	84 44 22.2	.....
T. 5 N., R. 4 W., corner of secs. 23, 24, 25, and 26; 510 feet north of crossroads	42 47 57.2	84 44 21.6	5,290
T. 5 N., R. 4 W., corner of secs. 13, 14, 23, and 24; crossroads	42 48 49.4	84 44 21.5	5,290
Lookingglass River, north end of bridge over	42 49 15.0	84 44 22.0	2,595
T. 5 N., R. 4 W., corner of secs. 11, 12, 13, and 14; crossroads	42 49 41.8	84 44 22.3	2,705
T. 5 N., R. 4 W., corner of secs. 1, 2, 11, and 12; stone in crossroads	42 50 34.2	84 44 22.5	5,310
T. 5 N., R. 4 W., north corner of secs. 1 and 2; T road south (50 feet east of above corner is south corner of secs. 35 and 36, T. 6 N., R. 4 W., T road north.)	42 51 25.2	84 44 22.8	5,160
Westphalia District No. 3 schoolhouse, 35 feet south by 20 feet west of corner of secs. 25, 26, 35, and 36, T. 6 N., R. 4 W., in southwest corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 1, 1913, Mich."	42 52 17.0	84 44 22.5	5,242
Westphalia schoolhouse, about 1 mile north of; crossroads	42 53 06.4	84 44 22.7	4,999
T. 6 N., R. 4 W., corner of secs. 13, 14, 23, and 24, stone in crossroads	42 54 01.7	84 44 22.7	5,605
T. 6 N., R. 4 W., corner of secs. 11, 12, 13, and 14; crossroads	42 54 53.9	84 44 22.8	5,285
T. 6 N., R. 4 W., corner of secs. 1, 2, 11, and 12, at Westphalia schoolhouse (District No. 1); crossroads	42 55 46.1	84 44 23.0	5,280
Tps. 6 and 7 N., R. 4 W., corner of secs. 1, 2, 35, and 36; crossroads	42 56 37.7	84 44 23.1	5,225
T. 7 N., R. 4 W., corner of secs. 25, 26, 35, and 36; T road west at schoolhouse	42 57 28.6	84 44 22.4	5,160
Stony Creek, north end of bridge over	42 57 47.9	84 44 22.6	1,945
T. 7 N., R. 4 W., corner of secs. 23, 24, 25, and 26; stone in crossroads	42 58 21.3	84 44 22.3	3,380
T. 7 N., R. 4 W., corner of secs. 13, 14, 23, and 24; crossroads	42 59 14.0	84 44 22.6	5,340

Magnetic declination near west border of quadrangle, 0° 50′ W.

DURAND QUADRANGLE.

Along highways near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 7 N., R. 4 E., 15 feet south by 30 feet west of corner of secs. 15, 16, 21, and 22, at southwest corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 18, Michigan 1913"	42 59 58.0	83 59 13.2	.....
T. 7 N., R. 4 E., corner of secs. 21, 22, 27, and 28; crossroads	42 59 06.0	83 59 12.8	5,260
T. 7 N., R. 4 E., corner of secs. 27, 28, 33, and 34; crossroads	42 58 14.0	83 59 12.9	5,270
T. 7 N., R. 4 E., south corner of secs. 33 and 34	42 57 20.4	83 59 14.4	5,420
T. 6 N., R. 4 E., north corner of secs. 3 and 4	42 57 20.3	83 59 21.4	520
T. 6 N., R. 4 E., corner of secs. 3, 4, 9, and 10; crossroads	42 56 22.9	83 59 19.7	5,810
Durand, intersection of Main and Oak streets; corner of secs. 15, 16, 21, and 22; T. 6 N., R. 4 E	42 54 38.6	83 59 16.2	10,570
T. 6 N., R. 4 E., corner of secs. 21, 22, 27, and 28; crossroads	42 53 46.3	83 59 14.8	5,291
T. 6 N., R. 4 E., corner of secs. 27, 28, 33, and 34; crossroads at schoolhouse	42 52 54.2	83 59 13.2	5,280

Magnetic declination near west border of quadrangle, 1° 58′ W.

ELSIE QUADRANGLE.

Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
North Star, 3 miles east of, 30 feet north by 30 feet east of west corner of secs. 18 and 19, T. 10 N., R. 1 W., 30 feet E. by 180 feet north of east corner of secs. 13 and 24, T. 10 N., R. 2 W., in northeast corner of T road east; iron post stamped "Prim. Trav. Sta. No. 6 Michigan 1913"	43 14 54.8	84 29 01.8	.....
T. 10 N., R. 1 W., corner of secs. 17, 18, 19, and 20; crossroads	43 14 54.6	84 28 07.5	4,020
T. 10 N., R. 1 W., corner of secs. 16, 17, 20, and 21; crossroads	43 14 53.9	84 26 55.6	5,320
T. 10 N., R. 1 W., corner of secs. 15, 16, 21, and 22; crossroads	43 14 54.3	84 25 43.7	5,320
T. 10 N., R. 1 W., corner of secs. 14, 15, 22, and 23; crossroads	43 14 54.7	84 24 32.6	5,250
T. 10 N., R. 1 W., 10 feet east of east corner of secs. 13 and 24, 10 feet east of center of T road west, on county line road; iron post stamped "Prim. Trav. Sta. No. 7 Michigan 1913"	43 14 54.6	84 22 08.5	10,671
T. 10 N., R. 1 E., west corner of secs. 20 and 29; Gratiot-Saginaw county line; T road east	43 14 37.5	84 22 08.4	1,730
T. 10 N., R. 1 E., corner of secs. 21, 22, 27, and 28; crossroads	43 14 37.7	84 20 52.4	5,630
Marion Springs, corner of secs. 22, 23, 26, and 27, T. 10 N., R. 1 E.; crossroads	43 14 38.0	84 19 40.8	5,300
T. 10 N., R. 1 E., corner of secs. 23, 24, 25, and 26; crossroads	43 14 38.2	84 18 29.2	5,300
T. 10 N., R. 1 E., east corner of secs. 24 and 25	43 14 37.6	84 17 17.8	5,280
(90 feet north of the above position is west corner of secs. 30 and 19, T. 10 N., R. 2 E.)			
T. 10 N., R. 2 E., corner of secs. 19, 20, 29, and 30; crossroads	43 14 39.1	84 16 06.9	5,255

Along highways near west border of quadrangle.

T. 8 N., R. 2 W., quarter corner between secs. 25 and 36, at T road north	43 02 43.2	84 29 38.7	.....
T. 8 N., R. 2 W., quarter corner between secs. 24 and 25, at crossroads	43 03 35.1	84 29 38.4	5,260
T. 8 N., R. 2 W., quarter corner in center of sec. 24, at crossroads	43 04 01.3	84 29 38.3	2,650
T. 8 N., R. 2 W., quarter corner in center of sec. 13, at T road south	43 04 53.6	84 29 38.4	5,300

Along highways near south border of quadrangle.

T. 7 N., R. 2 W., east corner of secs. 12 and 13, at T road west	43 00 03.3	84 29 02.5	.....
(95 feet south of above corner is west corner of secs. 7 and 18, T. 7 N., R. 1 W., at T road east.)			
T. 7 N., R. 1 W., corner of secs. 7, 8, 17, and 18, at crossroads	43 00 02.5	84 27 53.0	5,166
T. 7 N., R. 1 W., corner of secs. 8, 9, 16, and 17, at T road	43 00 02.5	84 26 42.4	5,245
T. 7. N., R. 1 W., corner of secs. 9, 10, 15, and 16, at T road	43 00 03.5	84 25 32.4	5,203
T. 7 N., R. 1 W., corner of secs. 10, 11, 14, and 15	43 00 04.0	84 24 20.8	5,320
Ovid, 0.75 mile west of and 0.25 mile south of, on east side of north and south road at T road west, 5 feet south and 25 feet east of corner of secs. 11, 12, 13, and 14, T. 7 N., R. 1 W.; iron post stamped "Prim. Trav. Sta. No. 5, 1915, Mich."	43 00 04.7	84 23 10.7	5,214
vid, crossing of Main and Front streets	43 00 18.9	84 22 18.2	4,153
vid, 180 feet east of intersection of Elm and Oak streets; center of Elm Street at crossing of principal meridian	43 00 10.1	84 22 00.1	1,620
Ovid, about 0.15 mile east of; center of road at crossing of line between sec. 16 and fractional sec. 17, T. 7 N., R. 1 E	43 00 08.3	84 21 50.1	767

Along highways through center of quadrangle.

T. 8 N., R. 2 E., corner of secs. 5, 6, 7, and 8; crossroads at schoolhouse	43 06 53.3	84 15 56.8	.....
T. 8 N., R. 2 E., west corner of secs. 6 and 7	43 06 52.6	84 17 07.1	5,216
(45 feet south of above at crossroads is east corner of secs. 1 and 12, T. 8 N., R. 1 E.)			
T. 8 N., R. 1 E., corner of secs. 1, 2, 11, and 12; crossroads	43 06 52.8	84 18 18.5	5,295
T. 8 N., R. 1 E., corner of secs. 2, 3, 10, and 11; crossroads	43 06 52.6	84 19 31.0	5,380
T. 8 N., R. 1 E., corner of secs. 3, 4, 9, and 10; T road south	43 06 51.4	84 20 40.1	5,130
T. 8 N., R. 1 E., corner of secs. 4, 5, 8, and 9; center of east and west road	43 06 50.5	84 21 52.5	5,370
T. 8 N., R. 1 E., west corner of fractional secs. 8 and 9; T road east on Shiawassee-Gratiot county line	43 06 50.4	84 22 04.2	870
Clinton-Gratiot County line, about 0.5 mile north of, at southwest corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 9, 1915, Mich."	43 07 28.2	84 22 05.2	3,827

ELSIE QUADRANGLE—Continued.

Along highways through center of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 8 N., R. 1 W., north corner of secs. 1 and 2	43 07 04.0	84 23 15.7	5,776
(10 feet east of above corner is south corner of secs. 35 and 36; T. 9 N., R. 1 W.; crossroads on Clinton-Gratiot county line.)			
Tps. 8 and 9 N., R. 1 W., corner of secs. 2, 3, 34, and 35; crossroads	43 07 03.8	84 24 27.2	5,300
T. 8 N., R. 1 W., north corner of secs. 3 and 4; T road south	43 07 03.6	84 25 37.4	5,210
(75 feet west of above corner is south corner of secs. 33 and 34, T. 9 N., R. 1 W., at T road north.)			
T. 8 N., R. 1 W., north corner of secs. 4 and 5; T road south	43 07 03.4	84 26 48.6	5,280
(75 feet west of above is south corner of secs. 32 and 33 T. 9 N., R. 1 W., T road north.)			
T. 8 N., R. 1 W., north corner of secs. 5 and 6; T road south	43 07 03.2	84 28 00.2	5,310
(70 feet west of above corner is south corner of secs. 31 and 32, T. 9 N., R. 1 W., T road north.)			
Tps. 8 and 9 N., Rs. 1 and 2 W., crossroads at corner of	43 07 03.2	84 29 01.7	4,560

Magnetic declination for north border of quadrangle, 1° 39′ W.; for south border, 1° 33′ W.; for east border, 2° 05′ W.; for west border, 1° 20′ W.; through center, 1° 32′ W.

FOWLERVILLE QUADRANGLE.

Along highways near northeast corner of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 4 N., R. 4 E., west corner of secs. 7 and 18; T road east	42 44 36.2	84 02 16.8	.....
T. 4 N., R. 3 E., quarter corner between secs. 13 and 14; iron post stamped "Prim. Trav. Sta. No. 1, Mich., 1908"	42 44 09.9	84 03 26.9	5,870

FREELAND QUADRANGLE.

Along highways near south border of quadrangle.

T. 13 N., R. 4 E., corner of secs. 20, 21, 28, and 29; stone in crossroads	43 30 33.5	84 00 52.7	.....
T. 13 N., R. 4 E., corner of secs. 19, 20, 29, and 30; stone in crossroads	43 30 34.4	84 02 04.0	5,261
T. 13 N., R. 4 E., west corner of secs. 19 and 30; T road east	43 30 35.0	84 03 05.8	4,556
(80 feet south of above position is east corner of secs. 24 and 25, T. 13 N., R. 3 E., T road west.)			
T. 13 N., R. 3 E., corner of secs. 23, 24, 25, and 26; crossroads	43 30 35.5	84 04 17.2	5,259
T. 13 N., R. 3 E., corner of secs. 22, 23, 26, and 27, 720 feet west of railroad crossing and 520 feet north of another railroad crossing; crossroads	43 30 36.1	84 05 28.6	5,270
T. 13 N., R. 3 E., corner of secs. 14, 15, 22, and 23; crossroads	43 31 28.3	84 05 27.6	5,290
Freeland, east edge of town, 30 feet north by 25 feet west of corner of secs. 15, 16, 21, and 22, at northwest corner of T road north; iron post stamped "Prim. Trav. Sta. No. 13 Mich., 1913."	43 31 29.0	84 06 38.6	5,231
Freeland, east end of bridge over Tittabawassee River	43 31 29.5	84 07 30.7	3,844
T. 13 N., R. 3 E., corner of secs. 16, 17, 20, and 21	43 31 29.7	84 07 49.0	1,350
T. 13 N., R. 3 E., quarter corner between secs. 20 and 29; crossroads (this quarter corner computes 2,720 feet west of above corner; topographer should look for 100-foot error)	43 30 37.7	84 08 25.9	5,923
T. 13 N., R. 3 E., corner of secs. 19, 20, 29, and 30; crossroads	43 30 38.0	84 09 01.7	2,640
T. 13 N., Rs. 2 and 3 E., corner of secs. 19, 30, 24, and 25; crossroads (Midland-Saginaw county line)	43 30 38.7	84 10 12.6	5,230
T. 13 N., R. 2 E., corner of secs. 23, 24, 25, and 26; crossroads	43 30 38.8	84 11 24.2	5,280
T. 13 N., R. 2 E., corner of secs. 22, 23, 26, and 27; crossroads	43 30 38.2	84 12 35.8	5,280
T. 13 N., R. 2 E., corner of secs. 21, 22, 27, and 28; crossroads	43 30 38.0	84 13 47.6	5,290
T. 13 N., R. 2 E., 20 feet north by 20 feet west of corner of secs. 20, 21, 28, and 29, in northwest corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 14, Mich., 1913."	43 30 37.8	84 14 59.1	5,275

Magnetic declination for south border of quadrangle, 1° 31′ W.

LAINGSBURG QUADRANGLE.

Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 7 N., R. 1 E., corner of secs. 15, 16, 21, and 22; T road north	42 59 55.8	84 20 39.4	.....
T road west	42 59 46.1	84 19 10.4	6,687
T. 7 N., R. 1 E., corner of secs. 13, 14, 23, and 24; T road north	42 59 57.2	84 18 17.4	4,096
T. 7 N., R. 1 E., east corner of secs. 13 and 24	42 59 57.1	84 17 04.7	5,400
(140 feet north of above corner is west corner of secs. 18 and 19, T. 7 N., R. 2 E.)			
Center of road at north and south section line crossing	42 59 39.2	84 15 55.6	5,446

Magnetic declination for north border of quadrangle, 1° 33′ W.

MERRILL QUADRANGLE.

Along highways near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 13 N., R. 2 E., south corner of secs. 32 and 33; crossroads (Midland-Saginaw county line	43 28 53.4	84 15 00.6	.....
(30 feet east of above position is north corner of secs. 4 and 5, T. 12 N., R. 2 E.)			
T. 12 N., R. 2 E., corner of secs. 4, 5, 8, and 9; crossroads	43 27 51.1	84 15 00.5	6,310

Magnetic declination for east border of quadrangle, 1° 48′ W.

MUIR QUADRANGLE.

Along highways near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Grand Ledge, 3 miles west of, at northeast corner of church, 25 feet north by 25 feet east to stone at corner of secs. 5, 6, 7, and 8, T. 4 N., R. 4 W., at crossroads; iron post stamped "Prim. Trav. Sta. No. 2 Michigan 1909"	42 45 19.4	84 49 06.0	.....
T. 4 N., R. 4 W., north corner of secs. 5 and 6	42 46 13.1	84 49 05.6	5,437
(15 feet east of above position is south corner of secs. 31 and 32, T. 5 N., R. 4 W., crossroads.)			
T. 5 N., R. 4 W., corner of secs. 29, 30, 31, and 32; crossroads	42 47 05.4	84 49 05.4	5,290
Grand River, near east end of bridge over, T. 5 N., R. 4 W.; corner of secs. 28, 29, 32, and 33	42 47 05.3	84 47 56.8	5,115
T. 5 N., R. 4 W., corner of secs. 27, 28, 33, and 34; T road north	42 47 04.9	84 46 43.4	5,475
T. 5 N., R. 4 W., corner of secs. 26, 27, 34, and 35; crossroads	42 47 05.0	84 45 32.6	5,275

Near west border of quadrangle.

Sunfield, Pere Marquette R. R. crossing	42 45 46.7	84 59 42.3	.....
T. 5 N., R. 6 W., corner of secs. 34 and 35, 15 feet west of corner of secs. 2 and 3, T. 4 N., R. 6 W., crossroads	42 46 13.9	84 59 42.3	2,757
T. 5 N., R. 6 W., corner of secs. 26, 27, 34, and 35, center of crossroads	42 47 06.0	84 59 42.2	5,272
T. 5 N., R. 6 W., corner of secs. 22, 23, 26, and 27, center of crossroads	42 47 58.1	84 59 42.1	5,271
T. 5 N., R. 6 W., corner of secs. 14, 15, 22, and 23, center of crossroads	42 48 50.1	84 59 42.2	5,262
T. 5 N., R. 6 W., corner of secs. 10, 11, 14, and 15, fence line	42 49 42.1	84 59 22.5	5,265
T. 5 N., R. 6 W., corner of secs. 2, 3, 10, and 11, center of crossroads	42 50 34.3	84 59 42.6	5,280
Tps. 5 and 6 N., R. 6 W., corner of secs. 2, 3, 34, and 35, center of T road east	42 51 24.9	84 59 42.7	5,118
T. 6 N., R. 6 W., corner of secs. 22, 23, 26, and 27	42 53 08.9	84 59 42.3	.....
T. 6 N., R. 6 W., corner of secs. 14, 15, 22, and 23, center of crossroads	42 54 01.0	84 59 42.6	5,267

MUIR QUADRANGLE—Continued.

Near west border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 6 N., R. 6 W., corner of secs. 10, 11, 14, and 15, center of cross-roads	42 54 53.2	84 59 43.0	5,280
T. 6 N., R. 6 W., corner of secs. 2, 3, 10, and 11, center of crossroads	42 55 45.2	84 59 42.9	5,267
T. 6 N., R. 6 W., corner of secs. 2 and 3, 30 feet west, corner of secs. 34 and 35, T. 7 N., R. 6 W., T road east	42 56 37.4	84 59 43.5	5,281
T. 7 N., R. 6 W., corner of secs. 26, 27, 34, and 35, center of T road south	42 57 29.8	84 59 43.8	5,360

Through center of quadrangle.

Portland, 4.5 miles west of, 27 feet south by 23 feet east is corner of secs. 26, 27, 34, and 35, T. 6. N, R. 6 W., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 29, Mich. 1915"	42 52 16.5	84 59 42.3	.....
T. 6 N., Rs. 5 and 6 W., corner of secs. 25, 30, 31, and 36, center of crossroads	42 52 17.0	84 57 21.7	10,469
T. 6 N., R. 5 W., quarter corner between secs. 30 and 31, center of T road north	42 52 17.1	84 56 44.5	2,770
T. 6 N., R. 5 W., corner of secs. 28, 29, 32, and 33, fence line	42 52 17.3	84 54 58.1	7,915
Portland, west abutment, lower iron bridge over Grand River	42 52 15.0	84 54 12.1	3,433
Portland, 2.5 miles east of, 39 feet north by 18 feet east is corner of secs. 25, 26, 35, and 36, T. 6 N., R. 5 W. center of T road north; iron post stamped "Prim. Trav. Sta. No. 30, Mich. 1915"	42 52 18.2	84 51 24.9	12,455
T. 6 N., Rs. 4 and 5 W., corner of secs. 25, 30, 31, and 36, center of crossroads	42 52 17.5	84 50 14.1	5,264
T. 6 N., R. 4 W., corner of secs. 29, 30, 31, and 32, center of cross-roads	42 52 17.3	84 49 05.2	5,134
T. 6 N., R. 4 W., corner of secs. 28, 29, 32, and 33, center of T road west	42 52 17.4	84 47 54.6	5,254
Tps. 5 and 6 N., R. 4 W., corner of secs. 4, 5, 32, and 33, center of crossroads	42 51 25.4	84 47 54.6	5,270
T. 5 N., R. 4 W., corner of secs. 3 and 4, center of T road south, 42 feet east is corner of secs. 33 and 34, T. 6 N., R. 4 W., center of T road north	42 51 25.2	84 46 44.3	5,230
T. 6 N., R. 4 W., corner of secs. 34 and 35, 25 feet west, corner of secs. 2 and 3, T. 5 N., R. 4 W., crossroads	42 51 25.3	84 45 33.0	5,310
T. 6 N., R. 4 W., corner of secs. 26, 27, 34, and 35, center of T road east	42 52 17.3	84 45 32.6	5,270

Magnetic declination near west border of quadrangle, 0° 30′ W.; near east border, 0° 50′ W.; through center, 0° 30′ W.

PERRINTON QUADRANGLE.

Along highways near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Fowler, cross streets in, 1 block south of railroad, at corner of secs. 11, 12, 13, and 14, T. 7 N., R. 4 W	43 00 06.4	84 44 22.8	.....
Fowler, at southwest corner of first cross street north of railroad; iron post stamped "Prim. Trav. Sta. No. 2, Michigan, 1913"	43 00 12.1	84 44 23.3	572
T. 7 N., R. 4 W., corner of secs. 1, 2, 11, and 12; crossroads at school-house	43 00 58.8	84 44 22.7	4,726
T. 7 N., R. 4 W., north corner of secs. 1 and 2; stone in crossroads. (30 feet east of above corner is south corner of secs. 35 and 36, T. 8 N., R. 4 W., crossroads.)	43 01 56.0	84 44 22.7	5,790
T. 8 N., R. 4 W., corner of secs. 25, 26, 35, and 36; crossroads at Lebanon schoolhouse	43 02 48.4	84 44 22.0	5,305
T. 8 N., R. 4 W., corner of secs. 23, 24, 25, and 26; T road west	43 03 40.6	84 44 21.8	5,290
T. 8 N., R. 4 W., corner of secs. 1, 2, 11, and 12; stone at schoolhouse	43 06 17.4	84 44 20.8	.....
Tps. 8 and 9 N., 30 feet south by 25 feet east of corner of secs. 1, 2, 35, and 36, at southeast corner of crossroads, on Clinton-Gratiot county line; iron post stamped "Prim. Trav. Sta. No. 3, 1913, Mich."	43 07 05.2	84 44 20.9	4,842
North Shade schoolhouse, T. 9 N., R. 4 W., corner of secs. 25, 26, 35, and 36; crossroads at	43 07 57.6	84 44 20.9	5,300
T. 9 N., R. 4 W., corner of secs. 23, 24, 25, and 26, at U. B. Church; stone in crossroads	43 08 49.8	84 44 20.4	5,280
North Shade, T. 9 N., R. 4 W., corner of secs. 13, 14, 23, and 24, at District No. 3 schoolhouse; stone in crossroads	43 09 42.0	84 44 19.9	5,290

PERRINTON QUADRANGLE—Continued.

Along highways near west border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 9 N., R. 4 W., corner of secs. 11, 12, 13, and 14; crossroads	43 10 34.1	84 44 19.4	5,270
North Shade District No. 6 schoolhouse, T. 9 N., R. 4 W., corner of secs. 1, 2, 11, and 12; crossroads	43 11 26.3	84 44 19.0	5,290
T. 9 N., R. 4 W., north corner of secs. 1 and 2, stone at T road south. (40 feet east of above corner is south corner of secs. 35 and 36, T. 10 N., R. 4 W., stone in T road north.)	43 12 17.4	84 44 18.5	5,169
New Haven District No. 8 schoolhouse, T. 10 N., R. 4 W., corner of secs. 25, 26, 35, and 36; crossroads	43 13 09.5	84 44 17.3	5,280
T. 10 N., R. 4 W., corner of secs. 23, 24, 25, and 26; crossroads	43 14 01.7	84 44 16.8	5,280
New Haven District No. 3 schoolhouse, T. 10 N., R. 4 W., 25 feet south by 25 feet east of corner of secs. 13, 14, 23, and 24, southeast corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 4, Mich. 1913"	43 14 53.7	84 44 16.4	5,268
T. 10 N., R. 4 W., east corner of secs. 13 and 24; stone. (75 feet north of preceding position is west corner of secs. 18 and 19, T. 10 N., R. 3 W.)	43 14 53.5	84 43 05.6	5,239
T. 10 N., R. 3 W., corner of secs. 17, 18, 19, and 20	43 14 54.0	84 41 59.0	4,929
T. 10 N., R. 3 W., corner of secs. 16, 17, 20, and 21; stone	43 14 53.8	84 40 48.1	5,250
T. 10 N., R. 3 W., corner of secs. 15, 16, 21, and 22; crossroads	43 14 53.6	84 39 36.6	5,290
T. 10 N., R. 3 W., corner of secs. 14, 15, 22, and 23; crossroads	43 14 53.1	84 38 25.7	5,250
T. 10 N., R. 3 W., corner of secs. 13, 14, 23, and 24; crossroads	43 14 53.0	84 37 14.9	5,240
T. 10 N., R. 3 W., 10 feet south by 30 feet east of east corner of secs. 13 and 24, 30 feet south by 30 feet east of west corner of secs. 18 and 19, T. 10 N., R. 2 W., at south corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 5 Michigan 1913"	43 14 52.8	84 36 02.6	5,347
North Star District No. 4 schoolhouse, T. 10 N., R. 2 W., corner of secs. 17, 18, 19, and 20; crossroads	43 14 52.9	84 34 59.0	4,710
T. 10 N., R. 2 W., corner of secs. 16, 17, 20, and 21; crossroads	43 14 52.9	84 33 47.3	5,305
North Star, corner of secs. 15, 16, 21, and 22, T. 10 N., R. 2 W.; crossroads	43 14 52.8	84 32 36.5	5,245
T. 10 N., R. 2 W., corner of secs. 14, 15, 22, and 23; crossroads	43 14 53.0	84 31 25.0	5,290
T. 10 N., R. 2 W., corner of secs. 13, 14, 23, and 24; crossroads at schoolhouse	43 14 52.9	84 30 14.3	5,230

Along highways near south border of quadrangle.

T. 7 N., R. 4 W., east corner of secs. 12 and 13. (50 feet south of above corner is west corner of secs. 7 and 18, T. 7 N., R. 3 W.)	43 00 06.6	84 43 11.2	.....
T. 7 N., R. 3 W., corner of secs. 7, 8, 17, and 18, at crossroads	43 00 05.9	84 41 59.7	5,318
T. 7 N., R. 3 W., corner of secs. 8, 9, 16, and 17, at T road north	43 00 06.1	84 40 48.5	5,290
T. 7 N., R. 4 W., corner of secs. 9, 10, 15, and 16, at crossroads	43 00 05.5	84 39 37.7	5,260
T. 7 N., R. 4 W., 20 feet south and 30 feet west of corner of secs. 10, 11, 14, and 15, at southwest corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 1, 1915"	43 00 05.4	84 38 27.6	5,216
T. 7 N., Rs. 2 and 3 W., corner of secs. 12, 13, 7, and 18, at crossroads	43 00 04.9	84 36 05.7	10,540
T. 7 N., R. 2 W., corner of secs. 7, 8, 17, and 18, at crossroads	43 00 05.1	84 34 56.4	5,150
T. 7 N., R. 2 W., corner of secs. 8, 9, 16, and 17, at cross streets in St. John	43 00 05.3	84 33 45.3	5,290
T. 7 N., R. 2 W., corner of secs. 9, 10, 15, and 16, at T road east. (85 feet south of above corner is T road west.)	43 00 04.8	84 32 33.8	5,308
T. 7 N., R. 2 W., corner of secs. 10, 11, 14, and 15)	43 00 04.8	84 31 23.5	5,226
T. 7 N., R. 2 W., 15 feet north and 20 feet east of corner of secs. 11, 12, 13, and 14, in northeast corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 2, 1915"	43 00 04.6	84 30 12.7	5,267

Along highways near east border of quadrangle.

T. 7 N., R. 2 W., corner of secs. 1, 2, 11, and 12, at crossroads near schoolhouse	43 00 57.1	84 30 13.2	5,319
T. 7 N., R. 2 W., north corner of secs. 1 and 2. (80 feet west of above corner is south corner of secs. 35, and 36, T. 8 N., R. 2 W.)	43 01 51.0	84 30 13.6	5,460
T. 8 N., R. 2 W., corner of secs. 25, 26, 35, and 36, at T road south	43 02 43.3	84 30 14.4	5,295
T. 8 N., R. 2 W., quarter corner between secs. 13 and 14, at T road north	43 04 53.8	84 30 14.1	.....
T. 8 N., R. 2 W., quarter corner between secs. 11 and 12, at crossroads near schoolhouse	43 05 46.3	84 30 13.7	5,320
T. 8 N., R. 2 W., corner of secs. 1, 2, 11, and 12, at crossroads	43 06 12.4	84 30 13.6	2,640
Tps. 8 and 9 N., R. 2 W., 15 feet south and 20 feet west of corner of secs. 1, 2, 35, and 36, in southwest corner of crossroads on Clinton-Gratiot county line; iron post stamped "Prim. Trav. Sta. No. 3, 1915"	43 07 03.1	84 30 13.3	5,136
T. 9 N., R. 2 W., corner of secs. 25, 26, 35, and 36, at crossroads	43 07 55.8	84 30 12.8	5,340
T. 9 N., R. 2 W., corner of secs. 23, 24, 25, and 26, 400 feet north of bridge over Maple River	43 08 47.6	84 30 13.2	5,240

PERRINTON QUADRANGLE—Continued.

Along highways near east border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 9 N., R. 2 W., corner of secs. 13, 14, 23, and 24, at crossroads	43 09 40.0	84 30 13.0	5,310
T. 9 N., R. 2 W., corner of secs. 11, 12, 13, and 14, at crossroads	43 10 32.6	84 30 13.1	5,320
T. 9 N., R. 2 W., corner of secs. 1, 2, 11, and 12, at crossroads	43 11 25.0	84 30 13.1	5,310
Tps. 9 and 10 N., R. 2 W., corner of secs. 1, 2, 35, and 36, at crossroads	43 12 16.2	84 30 13.4	5,190
T. 10 N., R. 2 W., corner of secs. 25, 26, 35, and 36, at crossroads near schoolhouse	43 13 08.5	84 30 13.7	5,290
T. 10 N., R. 2 W., corner of secs. 23, 24, 25, and 26, at crossroads	43 14 00.6	84 30 14.1	5,280
T. 10 N., R. 2 W., corner of secs. 13, 14, 23, and 24, at crossroads near schoolhouse	43 14 52.9	84 30 14.3	5,285

Along highways through middle of quadrangle.

Tps. 8 and 9 N., R. 2 W., corner of secs. 2, 3, 34, and 35, at crossroads on county line	43 07 03.4	84 31 24.5	.....
Tps. 8 and 9 N., R. 2 W., corner of secs. 3, 4, 33, and 34, at crossroads on county line	43 07 03.5	84 32 35.7	5,290
Tps. 8 and 9 N., R. 2 W., corner of secs. 4, 5, 32, and 33, at crossroads on county line near church	43 07 03.4	84 33 47.0	5,290
Tps. 8 and 9 N., R. 2 W., corner of secs. 5, 6, 31, and 32	43 07 03.5	84 34 58.2	5,280
Tps. 8 and 9 N., Rs. 2 and 3 W., corner of secs. 1, 6, 31, and 36	43 07 03.5	84 36 02.3	4,760
T. 8 N., R. 3 W., 20 feet south and 40 feet west of corner of secs. 1 and 2, at southwest corner of T road south; iron post stamped "Prim. Trav. Sta. No. 4, 1915"	43 07 03.6	84 37 14.0	5,317
Tps. 8 and 9 N., R. 3 W., corner of secs. 2, 3, 34, and 35	43 07 03.8	84 38 24.9	5,260
T. 8 N., R. 3 W., corner of secs. 2, 3, 10, and 11, at crossroads	43 06 15.1	84 38 25.0	4,929
T. 8 N., R. 3 W., corner of secs. 3, 4, 9, and 10, at T road south	43 06 15.7	84 39 36.4	5,300
T. 8 N., R. 3 W., corner of secs. 4, 5, 8, and 9, near speed limit sign	43 06 16.4	84 40 47.7	5,290
Maple Rapids, 0.5 mile southwest of, T road south, on section line	43 06 10.2	84 41 59.0	5,334
Maple River, south end of bridge over	43 06 33.9	84 42 43.3	4,070
Iron post No. 31, 1913	43 07 05.2	84 44 20.9	7,905

Magnetic declination for north border of quadrangle, 1° 18′ W.; for south border, 0° 50′ W.; for east border, 1° 20′ W.; for west border, 0° 54′ W.; through center, 0° 54′ W.

SAGINAW QUADRANGLE.

Near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 11 N., R. 6 E., corner of secs. 3 and 4, center of T road south	43 23 33.6	83 45 32.2	.....
T. 12 N., R. 6 E., corner of secs. 27, 28, 33, and 34, center of crossroads	43 24 25.6	83 45 28.9	5,275
T. 12 N., R. 6 E., corner of secs. 21, 22, 27, and 28, Pere Marquette R. R. crossing	43 25 17.4	83 45 29.1	5,240
T. 12 N., R. 6 E., corner of secs. 15, 16, 21, and 22, center of T road south	43 26 09.7	83 45 29.5	5,290
Crossroads	43 27 01.7	83 45 18.3	.....
Crossroads	43 27 53.8	83 45 42.5	5,571

Near north border of quadrangle.

Arn, 1 mile west of, 23 feet north, 21 feet west, corner of secs. 27, 28, 33, and 34, T. 13 N., R. 6 E., center of T road north; iron post stamped "Prim. Trav. Sta. No. 23, Mich. 1915"	43 29 35.1	83 45 32.3	.....
T. 13 N., R. 6 E., corner of secs. 28, 29, 32, and 33, center of T road north	43 29 34.9	83 46 42.7	5,189
T. 13 N., R. 6 E., corner of secs. 29, 30, 31, and 32, center of crossroads	43 29 35.7	83 47 53.6	5,230
T. 13 N., Rs. 5 and 6 E., corner of secs. 31 and 36, center of T road south	43 29 34.9	83 49 04.7	5,235
South Bay City, 3 miles south and 2 miles east of, 15 feet north by 23 feet east, corner of secs. 25, 26, 35, and 36, T. 13 N., R. 5 E., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 24, Mich. 1915"	43 29 36.5	83 50 14.0	5,130

Magnetic declination near east border of quadrangle, 1° 45′ W.; near north border, 1° 45′ W.

SAGINAW QUADRANGLE—Continued.

Along highways near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 10 N., R. 4 E., corner of secs. 14, 15, 22, and 23; crossroads	43 15 48.8	83 58 19.0	
T. 10 N., R. 4 E., corner of secs. 13, 14, 23, and 24; crossroads	43 15 49.0	83 57 10.4	5,080
T. 10 N., R. 4 E., corner of secs. 11, 12, 13, and 14; crossroads	43 16 40.8	83 57 10.8	5,240
T. 10 N., R. 4 E., corner of secs. 1, 2, 11, and 12; crossroads	43 17 33.5	83 57 11.1	5,340
T. 10 N., R. 4 E., north corner of secs. 1 and 2	43 18 27.8	83 57 11.9	5,489
(60 feet west of above position and 190 feet south of south end of bridge over Flint River is south corner of secs. 35 and 36, T. 11 N., R. 4 E.)			
T. 11 N., R. 4 E., corner of secs. 25, 26, 35, and 36; crossroads	43 19 19.5	83 57 14.1	5,240
T. 11 N., R. 4 E., corner of secs. 23, 24, 25, and 26; crossroads	43 20 11.2	83 57 14.8	5,230
Youngs Corners, corner of secs. 13, 14, 23, and 24, T. 11 N., R. 4 E.; crossroads	43 21 03.2	83 57 17.0	5,271
Youngs Corners, 0.9 mile north of; south end of bridge over Cass River	43 21 52.4	83 57 18.5	4,980
T. 11 N., R. 4 E., corner of secs. 1, 2, 11, and 12	43 22 46.4	83 57 20.0	5,461
Saginaw, intersection of East and Youman streets (probably north corner of secs. 1 and 2, T. 11 N., R. 4 E.)	43 23 39.9	83 57 21.1	5,420
Saginaw, intersection of Center Street and Fordney Avenue	43 24 08.8	83 57 35.6	3,112
Saginaw, east end of Mackinaw Street bridge over Saginaw River	43 24 43.7	83 57 49.0	3,670
Saginaw, east side of north basement steps on east side of county courthouse, in top of stone facing; bronze tablet stamped "Prim. Trav. Sta. No. 11 Michigan 1913"	43 25 03.4	83 57 55.2	2,046
Saginaw, intersection of Court, Bay, and Alexander streets; water trough	43 25 33.2	83 58 32.6	4,085
Saginaw, intersection of Bay and State streets, corner of secs. 14, 15, 22, and 23, T. 12 N., R. 4 E	43 26 11.8	83 58 32.5	3,910
T. 12 N., R. 4 E., corner of secs. 10, 11, 14, and 15; crossroads at schoolhouse	43 27 03.5	83 58 33.3	5,240
T. 12 N., R. 4 E., corner of secs. 2, 3, 10, and 11; crossroads	43 27 55.3	83 58 33.3	5,250
Eisenhauer Corners, corner of secs. 2, 3, 34, and 35, Tps. 12 and 13 N., R. 4 E.; crossroads	43 28 48.1	83 58 33.1	5,340
Deutsche B. M. Kirche, corner of secs. 26, 27, 34, and 35, T. 13 N., R. 4 E.; crossroads	43 29 39.8	83 58 25.8	5,269
Saginaw, intersection of Michigan Avenue and Wheeler Street	43 24 02.6	83 59 30.3	
Saginaw, 50 feet southwest of intersection of Florence Street and Michigan Avenue; intersection of railroad and street-car line	43 24 17.8	83 58 48.2	3,477

Along highways near south border of quadrangle.

T. 10 N., R. 5 E., corner of secs. 19, 20, 29, and 30; crossroads	43 15 01.6	83 54 51.2	
T. 10 N., R. 5 E., corner of secs. 23, 24, 25, and 26; crossroads	43 15 02.9	83 50 05.1	
T. 10 N., Rs. 5 and 6 E., corner of secs. 24, 25, 19, and 30; crossroads	43 15 00.4	83 48 53.4	5,320
Birch Run, 1.3 miles east of; crossroads	43 15 00.5	83 46 10.3	
T. 10 N., R. 6 E., 25 feet north and 25 feet west of corner of secs. 21, 22, 27, and 28, at northwest corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 12, 1915, Mich."	43 15 00.4	83 45 17.7	3,889
T. 10 N., R. 6 E., corner of secs. 15, 16, 21, and 22; crossroads at Town Hall	43 15 51.9	83 45 17.9	5,210
T. 10 N., R. 6 E., corner of secs. 9, 10, 15, and 16; T road east	43 16 43.5	83 45 19.4	5,230
T. 10 N., R. 6 E., corner of secs. 3, 4, 9, and 10; crossroads	43 17 36.0	83 45 17.6	5,312
Tps. 10 and 11 N., R. 6 E., corner of secs. 3, 4, 33, and 34; crossroads	43 18 25.2	83 45 17.3	4,980
T. 11 N., R. 6 E., corner of secs. 27, 28, 33, and 34; T road south	43 19 18.3	83 45 18.1	5,380
Frankenmuth, at extreme west edge of; crossroads, probably corner of secs. 21, 22, 27, and 28, T. 11 N., R. 6 E	43 20 09.0	83 45 31.7	5,230
T. 11 N., R. 6 E., corner of secs. 15, 16, 21, and 22; crossroads	43 21 01.0	83 45 31.5	5,270
T. 11 N., R. 6 E., corner of secs. 9, 10, 15, and 16; crossroads	43 21 53.2	83 45 32.5	5,281
T. 11 N., R. 6 E., 30 feet south and 20 feet west of corner of secs. 3, 4, 9, and 10, at southwest corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 13, 1915, Mich."	43 22 45.8	83 45 32.4	5,326
NOTE.—Post is set 1.5 feet north of above position.			

Along highways through middle of quadrangle.

T. 11 N., R. 6 E., corner of secs. 4, 5, 8, and 9; crossroads	43 22 45.9	83 46 44.6	5,330
T. 11 N., R. 6 E., corner of secs. 5, 6, 7, and 8; crossroads	43 22 46.1	83 47 56.9	5,240
T. 11 N., R. 6 E., west corner of secs. 6 and 7; T road east	43 22 46.4	83 49 03.9	4,950
T. 11 N., R. 5 E., east corner of secs. 1 and 12; T road west	43 22 40.4	83 49 03.8	600
T. 11 N., R. 5 E., corner of secs. 1, 2, 11, and 12; crossroads at church	43 22 44.5	83 50 15.0	5,278
T. 11 N., R. 5 E., corner of secs. 2, 3, 10, and 11; crossroads	43 22 44.4	83 51 25.7	5,219
T. 11 N., R. 5 E., 30 feet south and 25 feet west of corner of secs. 3, 4, 9, and 10; iron post set at southwest corner of T road south stamped "Prim. Trav. Sta. No. 14, 1915, Mich."	43 22 44.8	83 52 36.2	5,210

SAGINAW QUADRANGLE—Continued.

Along highways through middle of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 11 N., R. 5 E., apparant corner of secs. 4, 5, 8, and 9; center of east and west road	43 22 45.5	83 53 45.9	5,149
T. 11 N., R. 5 E., corner of secs. 5, 6, 7, and 8; right angle turn in road just north of crossroad	43 22 45.7	83 54 58.0	5,320
T. 11 N., R. 5 E., corner of secs. 7, 8, 17, and 18; T road west	43 21 53.7	83 54 56.9	5,271
T. 11 N., R. 5 E., west corner of secs. 7 and 18; T road east	43 21 54.2	83 56 06.8	5,165
(120 feet north of above corner is apparently the east corner of secs. 12 and 13, T. 11 N., R. 4 E.)			
T. 11 N., R. 4 E., east corner of secs. 13 and 24; T road west	43 21 03.7	83 56 05.5	5,120
(20 feet south of above corner is west corner of secs. 18 and 19, T. 11 N., R. 5 E.)			
Youngs Corners, T. 11 N., R. 4 E., corner of secs. 13, 14, 23, and 24; crossroads	43 21 03.20	83 57 17.0	5,284

Magnetic declination for south border of quadrangle, 2° 10′ W.; for east border of south half, 1° 38′ W.; for west border, 2° 09′ W.; through center, 2° 15′ W.; near east border, 1° 45′ W.; near north border, 1° 45′ W.

ST. CHARLES QUADRANGLE.

Along highways near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 13 N., R. 2 E., corner of secs. 28, 29, 32, and 33; crossroads	43 29 45.7	84 14 59.7	.....
T. 12 N., R. 2 E., corner of secs. 8, 9, 16, and 17; crossroads	43 26 59.1	84 14 59.9	.....
T. 12 N., R. 2 E., corner of secs. 16, 17, 20, and 21; stone at T road east	43 26 07.1	84 14 59.5	5,270
T. 12 N., R. 2 E., corner of secs. 20, 21, 28, and 29; stone at T road west	43 25 15.1	84 14 58.9	5,260
Hemlock, 1 mile west of, quarter corner between secs. 28 and 29, T. 12 N., R. 2 E.; crossroads	43 24 49.1	84 14 58.5	2,637
T. 12 N., R. 2 E., corner of secs. 28, 29, 32, and 33; crossroads	43 24 23.1	84 14 58.2	2,630
T. 12 N., R. 2 E., south corner of secs. 32 and 33; T road north	43 23 30.9	84 14 57.2	5,280
(130 feet west of preceding position is north corner of secs. 4 and 5, T. 11 N., R. 2 E., T road south.)			
T. 11 N., R. 2 E., 20 feet north by 20 feet west of corner of secs. 4, 5, 8, and 9, in northwest corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 15, Mich. 1913"	43 22 36.6	84 14 57.6	5,495
T. 11 N., R. 2 E., corner of secs. 8, 9, 16, and 17; crossroads	43 21 44.4	84 14 56.0	5,290
T. 11 N., R. 2 E., corner of secs. 16, 17, 20, and 21; crossroads	43 20 52.4	84 14 56.0	5,270
T. 11 N., R. 2 E., corner of secs. 20, 21, 28, and 29; crossroads at church and schoolhouse	43 20 00.3	84 14 56.0	5,280
T. 11 N., R. 2 E., corner of secs. 28, 29, 32, and 33; crossroads	43 19 08.1	84 14 56.1	5,280
T. 11 N., R. 2 E., south corner of secs. 32 and 33; T road north	43 18 14.4	84 14 54.2	5,441
(285 feet west of preceding position is north corner of secs. 4 and 5, T. 10 N., R. 2 E., T road south.)			
Bad River bridge, just south of; cross roads	43 17 39.7	84 14 58.0	3,526
T. 10 N., R. 2 E., corner of secs. 4, 5, 8, and 9; crossroads	43 17 16.1	84 14 57.8	2,390
T. 10 N., R. 2 E., corner of secs. 8, 9, 16, and 17; crossroads	43 16 24.0	84 14 57.2	5,280
T. 10 N., R. 2 E., corner of secs. 16, 17, 20, and 21; crossroads	43 15 31.8	84 14 56.6	5,280

Along highways through center of quadrangle.

T. 11 N., R. 2 E., corner of secs. 3, 4, 9, and 10; crossroads at schoolhouse	43 22 38.6	84 13 47.1	.....
T. 11 N., R. 2 E., corner of secs. 2, 3, 10, and 11; T road south	43 22 38.7	84 12 38.7	5,050
T. 11 N., R. 2 E., corner of secs. 1, 2, 11, and 12; stone in crossroads	43 22 40.4	84 11 25.4	5,420
T. 11 N., Rs. 2 and 3, corner of secs. 1, 12, 6, and 7; stone at crossroads	43 22 47.2	84 10 14.3	5,291
T. 11 N., R. 3 E., corner of secs. 5, 6, 7, and 8; crossroads	43 22 46.8	84 09 03.3	5,249
T. 11 N., R. 3 E., corner of secs. 4, 5, 8, and 9; crossroads	43 22 46.9	84 07 52.2	5,250
Swan Creek, 1 mile west of, 30 feet north by 25 feet west of corner of secs. 3, 4, 9, and 10, T. 11 N., R. 3 E.; iron post stamped "Prim. Trav. Sta. No. 16 Michigan 1913"	43 22 47.1	84 06 41.5	5,218
Swan Creek, south end of wagon bridge over	43 22 43.6	84 05 57.3	3,286
Swan Creek, east-west road at railroad crossing, just southwest of station	43 22 46.2	84 05 38.4	1,427
Swan Creek, corner of secs. 2, 3, 10, and 11, T. 11 N., R. 3 E.; crossroads	43 22 46.1	84 05 30.4	590

ST. CHARLES QUADRANGLE—Continued.

Along highways through center of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 11 N., R. 3 E., corner of secs. 1, 2, 11, and 12; crossroads	43 22 45.7	84 04 19.7	5,220
T. 11 N., R. 3 E., east corner of secs. 1 and 12; T road west	43 22 44.6	84 03 08.0	5,300
T. 11 N., R. 4 E., west corner of secs. 6 and 7; T road east	43 22 47.4	84 03 08.0	290
T. 11 N., R. 4 E., corner of secs. 5, 6, 7, and 8; at District No. 1 schoolhouse; crossroads	43 22 47.1	84 02 04.3	4,700
District No. 1 schoolhouse; 0.5 mile east of; center of east-west road at railroad crossing	43 22 46.6	84 01 28.6	2,640
Lincoln Corners, T. 11 N., R. 4 E., corner of secs. 4, 5, 8, and 9	43 22 46.2	84 00 53.6	2,580
Lincoln Corners, 0.8 mile north of, on north-south section line; T road south	43 23 25.1	84 00 54.4	3,940
Lincoln Corners, 1 mile northeast of, 0.6 mile south of Vogt Corners, 0.6 mile southwest of extreme south end of bridge over Tittabawassee River	43 23 34.1	84 00 39.5	1,432
Vogt Corners; T road south	43 24 03.0	84 00 39.5	2,930

Magnetic declination for north border of quadrangle, 1° 31′ W.; for south border, 1° 22′ W.; for east border, 2° 09′ W.; for west border, 1° 48′ W.; for center, 1° 59′ W.

VASSAR QUADRANGLE.

Near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Crossroads	43 26 19.4	83 44 58.5	.....
T. 12 N., R. 6 E., center of sec. 3, center of T road north	43 28 20.0	83 44 54.8	.....
Tps. 12 and 13 N., R. 6 E., quarter corner between secs. 3 and 34, center of crossroads	43 28 43.2	83 44 54.9	2,340
T. 13 N., R. 6 E., center of sec. 34, center of T road south	43 29 09.2	83 44 55.4	2,640
T. 13 N., R. 6 E., quarter corner between secs. 34 and 35, center of crossroads	43 29 09.4	83 44 19.8	2,630
T. 13 N., R. 6 E., corner of secs. 26, 27, 34, and 35, center of T road north, 100 feet west is Michigan Central R. R. crossing at Arn station	43 29 35.4	83 44 19.9	2,629

Magnetic declination near west border of quadrangle, 1° 30′ W.

Benzonia, Elk Rapids, Empire, Kingsley, Maple City, Thompsonville, and Traverse City quadrangles.

ANTRIM, BENZIE, GRAND TRAVERSE, KALKASKA, AND LEELANAU COUNTIES.

The following geographic positions were determined by primary traverse in 1915 by Oscar Jones, on North American datum, and are based on Sleeping Bear and Pyramid triangulation stations of the United States Lake Survey.

BENZONIA QUADRANGLE.

Near north border of quadrangle.

Station.	Latitude.	Longitude.	Distanee between stations.
	° ′ ″	° ′ ″	*Feet.*
Empire, 4 miles south of, 25 feet south by 20 feet west from quarter corner between secs. 7 and 18, center of T road east; is iron post stamped "Prim. Trav. Sta. No. 9, Mich. 1915"	44 44 51.0	86 02 57.1	.....
T. 27 N., R. 14 W., corner of secs. 7, 8, 17, and 18, center of crossroads	44 44 51.3	86 02 20.2	2,662
T. 27 N., R. 14 W., corner of secs. 8, 9, 16, and 17, center of crossroads	44 44 51.1	86 01 06.8	5,300

Magnetic declination for north border of quadrangle, 2° 00′ W.

ELK RAPIDS QUADRANGLE.

Along east shore of east arm of Grand Traverse Bay.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Crossroads	44 47 14.0	85 29 23.7	.....
Crossroads, section line east and west	44 48 07.5	85 28 53.2	5,846
Yuba, road forks at	44 49 23.9	85 27 31.7	9,719
Road forks	44 50 45.3	85 26 10.6	10,170
T road east, Grand Traverse-Antrim county line	44 51 35.1	85 25 42.7	5,428
Pere Marquette R. R. crossing	44 53 17.0	85 25 19.8	10,450
Elk Rapids, west end of Ottawa Street; iron post stamped "Prim. Trav. Sta. No. 14, Mich. 1915"	44 53 40.0	85 25 40.2	2,333
Elk Rapids, corner of Ottawa and Bridge streets	44 53 47.5	85 24 41.4	2,890
T road east	44 54 25.8	85 23 19.2	7,075
Kewadin Junction, west Michigan Pike and Kalkaska Road	44 55 46.2	85 21 57.3	10,054
Tps. 29 and 30 N., R. 9 W., corner of secs. 1, 2, 35, and 36, center of crossroads	44 56 46.5	85 21 09.8	6,994
T. 30 N., R. 9 W., corner of secs. 25, 26, 35, and 36, center of crossroads	44 57 39.3	85 21 11.0	5,350
T road west	44 58 32.4	85 21 20.2	5,417
T road east	44 58 58.8	85 21 18.4	2,680
Kewadin, 4 miles north by 1 mile east of; 25 feet south by 25 feet east of corner of secs. 13, 14, 23, and 24, center of crossroad; is iron post stamped "Prim. Trav. Sta. No. 15, Mich., 1915"	44 59 25.0	85 21 10.4	2,705

Through center of quadrangle from west to east.

T road east	44 55 29.4	85 21 17.3	.....
T road east	44 54 24.2	85 21 00.1	6,725
T. 29 N., R. 9 W., corner of secs. 23, 24, 25, and 26, center of T road west	44 53 18.8	85 21 09.8	6,664
T. 29 N., R. 9 W., corner of secs. 25, 26, 35, and 36, center of crossroads	44 52 26.5	85 21 10.4	5,290
Tps. 28 and 29 N., R. 9 W., corner of secs. 1, 2, 35, and 36, center of crossroads	44 51 34.5	85 21 10.6	5,270
T road east	44 51 34.4	85 20 22.6	3,460
Pearsons Harbor, road fork 470 feet west of drawbridge	44 51 00.8	85 19 45.7	4,327
Road fork	44 51 07.5	85 18 59.0	3,434
Alden, 1 mile south of Pere Marquette R. R. crossing	44 51 34.3	85 17 02.6	8,814

Near east border of quadrangle.

Alden, center of track opposite station, Pere Marquette R. R.	44 52 42.8	85 16 37.9	7,165
Pere Marquette R. R. crossing	44 53 18.5	85 16 26.0	3,711
Pere Marquette R. R. crossing	44 55 09.0	85 17 10.7	11,644
Pere Marquette R. R. crossing, section line east and west	44 55 55.6	85 17 12.7	4,720
Clam River, south end of iron bridge over	44 56 32.3	85 17 01.0	3,817
Road fork, section line east and west	44 56 47.2	85 16 46.4	1,838
T. 30 N., R. 8 W., quarter corner between secs. 33 and 34, center of T road north	44 57 13.4	85 16 18.9	3,308
T. 30 N., R. 8 W., corner of secs. 27, 28, 33, and 34, center of T road west	44 57 39.7	85 16 18.7	2,665
Bellaire, 3 miles west by 1 mile north of, 35 feet north by 25 feet west of corner of secs. 21, 22, 27, and 28, T. 30 N., R. 8 W., center of crossroads; is iron post stamped "Prim. Trav. Sta. No. 16, Mich. 1915"	44 58 32.8	85 16 18.8	5,374
T road south	44 55 59.4	85 16 19.1	.....
T. 29 N., R. 8 W., corner of secs. 9, 10, 15, and 16, center of crossroads	44 55 03.4	85 16 19.5	5,670
T. 29 N., R. 8 W., corner of secs. 10, 11, 14, and 15, center of crossroads	44 55 03.3	85 15 05.9	5,300
T. 29 N., R. 8 W., corner of secs. 14, 15, 22, and 23, center of crossroads	44 54 10.9	85 15 06.4	5,306
T. 29 N., R. 8 W., corner of secs. 22, 23, 26, and 27, center of crossroads	44 53 18.4	85 15 06.3	5,314
Alden, 1 mile east of, 25 feet east by 25 feet south of quarter corner between secs. 26 and 27, T. 29 N., R. 8 W., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 17, Mich. 1915"	44 52 52.0	85 15 06.1	2,677
Pere Marquette R. R. crossing	44 50 42.6	85 17 04.8	.....
Rapid City, center of track opposite station Pere Marquette R. R.	44 50 01.2	85 17 04.6	4,200
T. 28 N., R. 8 W., quarter corner between secs. 9 and 16, center of T road east	44 49 50.4	85 16 58.1	1,192
T road east	44 49 24.1	85 16 58.2	2,656
T. 28 N., R. 8 W., quarter corner between secs. 16 and 21, center of crossroads	44 48 58.0	85 16 58.1	2,670
T. 28 N., R. 8 W., center of secs. 21, center of T road east	44 48 32.0	85 16 58.1	2,630

ELK RAPIDS QUADRANGLE—Continued.

Near east border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 28 N., R. 8 W., corner of secs. 21, 22, 27, and 28, fence line	44 48 05.7	85 16 21.3	3,756
T road west	44 47 24.8	85 16 39.9	4,359
Rapid City, 4 miles south by 0.5 mile east of, 15 feet south by 20 feet west of center of crossroads; iron post stamped "Prim. Trav. Sta. No. 18, Mich. 1915"	44 46 50.9	85 16 22.6	3,647

Near south border of quadrangle.

Barker Creek, Pere Marquette R. R. crossing, 480 feet south of station	46 46 47.9	85 18 55.4	.....
T. 28 N., Rs. 8 and 9 W., quarter corner between secs. 31 and 36; center of crossroads	44 46 47.7	85 19 57.6	4,484
T. 28 N., R. 9 W., quarter corner between secs. 35 and 36, center of T road east	44 46 47.2	85 21 10.2	5,236
T. 28 N., R. 9 W., corner of secs. 1, 2, 35, and 36, center of T road north	44 46 22.1	85 21 10.8	2,540
Pere Marquette R. R. road crossing	44 46 22.2	85 22 30.0	5,712
Williamsburg, 1 mile east of, 35 feet east by 25 feet north of, quarter corner between secs. 3 and 34, Tps. 27 and 28 N., R. 9 W., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 19, Mich. 1915"	44 46 22.7	85 23 00.3	2,182
Tps. 27 and 28 N., R. 9 W., quarter corner between secs. 4 and 33, center of crossroads	44 46 22.5	85 24 13.6	5,284
Williamsburg, Pere Marquette R. R. road crossing, 300 feet west of station	44 46 22.4	85 24 36.5	1,656
Tps. 27 and 28 N., R. 9 W., corner of secs. 4, 5, 32, and 33, center of T road south	44 46 22.3	85 24 50.0	967
Tps. 27 and 28 N., R. 9 W., corner of secs. 5, 6, 31, and 32, center of crossroads	44 46 22.0	85 26 03.3	5,292
Tps. 27 and 28 N., R. 10 W., corner of secs. 1, 2, 35, and 36, center of crossroads	44 46 21.5	85 28 31.9	10,719
Tps. 27 and 28 N., R. 10 W., corner of secs. 2, 3, 34, and 35, center of T road north	44 46 24.5	85 29 57.4	6,174

Magnetic declination along east shore of east arm of Grand Traverse Bay, 1° 45′ W.; through center of quadrangle, 2° 00′ W.; near east border, 1° 45′ W.; near south border, 2° 00′ W.

EMPIRE QUADRANGLE.

Near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Road fork	44 52 39.6	86 02 22.8	7,676
Road fork	44 51 39.2	86 02 01.8	6,297
T road north junction West Michigan Pike with Maple City road	44 50 05.9	86 02 02.4	9,454
Empire, crossroads at high school	44 48 40.3	86 03 29.7	10,715
T. 27 N., R. 14 W., quarter corner between secs. 30 and 31, center of crossroads	44 47 35.1	86 02 58.6	6,975
T. 27 N., R. 14 W., quarter corner between secs. 6 and 31, center of crossroads	44 46 42.7	86 02 57.3	5,305
T. 27 N., R. 14 W., quarter corner between secs. 6 and 7, center of crossroads	44 45 43.6	86 02 56.8	5,985
Bennett Corners, 0.5 mile south of Glen Haven, 33 feet east, center of T road east; iron post stamped "Prim. Trav. Sta. No. 8, Mich. 1915"	44 53 53.0	86 01 46.0	.....
T road west	44 53 25.8	86 02 00.9	2,962
Sleeping Bear triangulation station, situated on the highest point of the hill, about 3 miles south and about 2 miles west of Glen Haven (signal found but no mark, 1915)	44 52 23.0	86 04 06.8	11,069

Magnetic declination near east border of quadrangle, 2° 0′ W.

KINGSLEY QUADRANGLE.

Near north border of quadrangle

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T road south	44 44 56.4	85 33 28.0	.....
Pere Marquette R. R. road crossing	44 44 47.2	85 31 33.4	8,321
T road west	44 44 48.0	85 31 21.0	900

Magnetic declination near north border of quadrangle, 2° 00′ W.

MAPLE CITY QUADRANGLE.

Near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T road south, north-south line between secs. 21 and 22, T. 3 N., R. 12 W	44 59 40.2	85 45 15.9	.....
Leland, 2 miles south of; junction West Michigan Pike and Provemont road; iron post stamped "Prim. Trav. Sta. No. 6, Mich. 1915"	44 59 40.9	85 46 09.8	3,874
Road fork	44 58 48.0	85 46 35.7	5,673
Road fork	44 57 02.7	85 47 59.0	12,231
Crossroads	44 56 38.7	85 48 08.2	2,514
Road fork, road south on line between secs. 7 and 12, T. 29 N., Rs. 12 and 13 W	44 56 13.8	85 48 40.5	3,433
Road fork	44 55 23.5	85 49 12.9	5,604
Shetland schoolhouse, crossroads at	44 55 00.7	85 49 51.6	3,617
T road south, on line between secs. 14 and 15, T. 29 N., R. 13 W	44 54 58.0	85 51 08.5	5,540
T. 29 N., R. 13 W., corner of secs. 9, 10, 15, and 16, center of crossroads	44 55 19.3	85 52 22.0	5,711
Bass Lake, 1 mile north of, 200 feet south of school, south side of road; iron post stamped "Prim. Trav. Sta. No. 7, Mich. 1915"	44 55 59.3	85 54 28.3	9,945
Road fork	44 56 07.9	85 55 14.8	3,459
T. 29 N., Rs. 13 and 14 W., corner of secs. 1, 6, 7, and 12, center of crossroads	44 56 16.7	85 56 11.4	4,167
Road fork	44 57 17.8	85 56 27.0	6,286
Pyramid triangulation station, situated on Pyramid Point near the lake shore on the highest point of the hill (remains of signal, no mark, 1915)	44 58 04.7	85 55 26.9	6,426
Road fork	44 54 42.7	85 57 27.3	.....
Road fork	44 54 23.6	85 58 20.4	4,284
Glenn Arbor, crossroads at	44 53 52.3	85 59 19.2	5,289

Near south border of quadrangle.

T. 27 N., R. 13 W., quarter corner between secs. 3 and 10, center of T road east	44 45 41.6	85 51 57.9	.....
T. 27 N., R. 13 W., corner of secs. 2, 3, 10, and 11, center of crossroads	44 45 41.5	85 51 20.9	2,665
T. 27 N., Rs. 12 and 13 W., corner of secs. 1, 2, 7, and 12, center of crossroads	44 45 41.6	85 50 07.1	5,329
Cedar Run crossing Manistee & Northeastern R. R., 200 feet south of station	44 45 46.8	85 48 52.0	5,444
T. 27 N., R. 12 W., corner of secs. 5, 6, 7, and 8, center of T road south	44 45 40.6	85 47 46.0	4,798
T. 27 N., R. 12 W., corner of secs. 4, 5, 8, and 9, center of T road north	44 45 39.1	85 46 32.9	5,280
Cedar Run, 3.5 miles east of, 35 feet north by 35 feet west from corner of secs. 3, 4, 9, and 10, T. 27 N., R. 12 W.; iron post stamped "Prim. Trav. Sta. No. 11, Mich. 1915"	44 45 38.4	85 45 20.3	5,238
T road south	44 46 27.5	85 45 18.0	4,980

Near east border of quadrangle.

T. 28 N., R. 12 W., corner of secs. 27, 28, 33, and 34, center of T road west	44 47 21.6	85 45 18.9	.....
T 28 N., R. 12 W., corner of secs. 21, 22, 27, and 28, center of T road south	44 48 14.5	85 45 19.0	5,364

MAPLE CITY QUADRANGLE—Continued.

Along Manistee & Northeastern R. R.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Solon, road crossing at	44 48 35.8	85 45 38.2	2,561
Cedar City, 100 feet south of station, west side of railroad; iron post stamped "Prim. Trav. Sta. No. 12, Mich. 1915"	44 50 51.0	85 47 34.0	16,030
Road crossing	44 52 01.1	85 47 49.0	7,189
Isadore, road crossing at	44 52 39.1	85 47 36.9	3,946
Bodus, road crossing at	44 54 24.2	85 46 58.9	10,996
Road crossing section line north and south	44 55 08.0	85 46 31.9	4,834
Schomberg, road crossing at	44 55 16.6	85 46 23.5	1,069
Road crossing	44 56 08.6	85 45 33.1	6,395
Road crossing	44 57 02.8	85 45 17.6	5,598
Road crossing	44 57 58.0	85 45 16.2	5,591

Magnetic declination near north border of quadrangle, 0° 45′ W.; near south border, 0° 15′ W.; near east border, 0° 30′ W.

THOMPSONVILLE QUADRANGLE.

Near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 27 N., R. 14 W., corner of secs. 10, 11, 14, and 15, center of cross-roads	44 44 51.1	85 59 53.7	
Empire & Southeastern R. R. road crossing	44 44 45.2	85 58 53.5	4,379
Crossroads	44 44 49.7	85 55 29.2	14,756
T road south	44 44 49.9	85 53 48.8	7,244
Almira Corners, corner of secs. 9, 10, 15, and 16, T. 27 N., R. 13 W., center of crossroads	44 44 49.8	85 52 35.8	5,270
Almira Corners, 1 mile east of, 30 feet south of quarter corner between secs. 10 and 15, T. 27 N., R. 13 W., center of T road north; iron post stamped "Prim. Trav. Sta. No. 10, Mich. 1915"	44 44 49.3	85 51 59.2	2,642

Magnetic declination near north border of quadrangle, 1° 00′ W.

TRAVERSE CITY QUADRANGLE.

East and west sides of the peninsula.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T road east	44 47 45.4	85 35 06.4	
T road east	44 48 55.4	85 34 40.7	7,323
T road east	44 49 36.0	85 33 57.8	5,107
T road east	44 50 11.0	85 33 41.9	3,750
T road east	44 51 42.4	85 32 57.0	9,798
Bowers Harbor, 1 mile south of, 10 feet west of center of T road east; iron post stamped "Prim. Trav. Sta. No. 1 Mich. 1915"	44 52 09.0	85 32 12.7	4,179
Bowers Harbor, road fork at	44 53 40.0	85 31 29.3	9,740
Road fork	44 53 54.8	85 30 54.5	2,916
T. 29 N., R. 10 W., corner of secs. 9, 10, 15, and 16, center of cross-roads	44 55 15.9	85 30 55.3	8,120
T. 29 N., R. 10 W., corner of secs. 3, 4, 9, and 10, center of cross-roads	44 56 08.5	85 30 55.3	5,424
T. 29 N., R. 10 W., corner of secs. 3, 4, 33, and 34, center of cross-roads	44 57 01.6	85 30 55.2	5,373
T. 29 N., R. 10 W., corner of secs. 27, 28, 33, and 34, center of cross-roads	44 57 54.5	85 30 54.8	5,363
Old mission, 1 mile west of, 35 feet south by 29 feet east of quarter corner between secs. 27 and 34, T. 29 N., R. 10 W., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 2, Mich., 1915"	44 57 54.4	85 30 16.3	2,769
T. 29 N., R. 10 W., quarter corner between secs. 3 and 10, center of T road west	44 56 08.8	85 30 17.3	10,695

TRAVERSE CITY QUADRANGLE—Continued.

East and west sides of the peninsula—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T 29 N., R. 10 W., quarter corner between secs. 10 and 15, center of T road west	44 55 14.9	85 30 17.6	5,460
T road west	44 54 41.6	85 30 12.5	3,384
Mapleton, road fork at	44 53 32.5	85 30 30.8	7,120
Road fork at school	44 51 16.1	85 31 38.7	.....
Road fork	40 50 16.5	85 32 10.0	6,443
Road fork	44 49 11.1	85 33 18.0	8,223
McKinley School, road fork at	44 47 47.1	85 34 29.3	9,941
Road fork	44 46 26.9	85 35 27.5	9,142
Traverse City, east side of road fork Old Mission and Elk Rapids	44 45 51.5	85 35 04.5	4,133
Near south border of quadrangle.			
Traverse City, center of south Maple and west Front streets	44 45 50.8	85 37 57.8	.....
Traverse City, center State and Park streets at Park Place Hotel	44 45 46.9	85 37 04.8	3,843
Crossroads	44 45 51.4	85 35 17.0	4,421
T road south	44 45 53.7	85 30 24.2	.....
Acme, 31 feet north by 5 feet east of center of T road east; iron post stamped "Prim. Trav. Sta. No. 13, Mich. 1915"	44 46 24.9	85 30 01.5	3,556
Elwood School, center of crossroads at	44 46 32.0	85 41 38.9	.....
Road forks	44 46 27.2	85 39 35.4	8,919
Traverse City, 36 feet north of center of West Michigan Pike and Empire Road; iron post stamped "Prim. Trav. Sta. No. 3, Mich. 1915"	44 46 31.4	85 38.30.2	4,725
Along west shore of west arm of Grand Traverse Bay.			
T road west	44 47 36.7	85 38 11.7	.....
T road west	44 50 12.5	85 39 04.0	16,222
T road west	44 51 35.0	85 38 58.1	8,367
Traverse City, 9 miles north of, 30 feet east of center of crossroads; iron post stamped "Prim. Trav. Sta. No. 4, Mich. 1915"	44 52 58.1	85 38 53.6	8,418
T road south	44 53 32.6	85 38 30.6	3,864
T road west at school	44 54 24.8	85 37 53.5	5,925
Road fork	44 55 20.0	85 37 29.5	5,854
T 29 N., R. 11 W., corner of secs. 3, 4, 9, and 10, fence line	44 56 09.1	85 38 00.3	5,444
T road east line between Tps. 29 and 30 N., R. 11 W	44 57 09.1	85 37 51.4	6,115
T road south, road south on section line	44 57 58.5	85 38 00.4	5,036
Sutton Bay, 39 feet north by 16 feet west of center of road fork; iron post stamped "Prim. Trav. Sta. No. 5, Mich. 1915"	44 58 50.6	85 38 49.2	6,336
Near north border of quadrangle.			
T road north	44 59 21.6	85 39 52.2	5,511
Road fork	44 59 51.9	85 40 31.0	4,154
Road fork	44 59 20.2	85 41 37.7	5,773
Provemont, east side of, center of crossroads	44 59 00.0	85 42 30.3	4,297
Provemont, 1 mile west of, crossing Manistee & Northeastern R. R	44 58 55.4	85 44 01.7	6,591
Manistee & Northeastern R. R. road crossing	44 58 18.3	85 44 41.8	.....

Magnetic declination east and west sides of the peninsula, 0° 45′ W.; near south border of quadrangle, 1° 30′ W.; along west shore of west arm of Grand Traverse Bay, 1° 00′ W.; near north border of quadrangle, 1° 00′ W.

IOWA.

PRIMARY TRAVERSE.

Albia, Attica, Chariton, Humeston, Melrose, and New Virginia quadrangles.

LUCAS, MARION, AND MONROE COUNTIES.

The following geographic positions on Des Moines astronomic datum were determined by C. B. Kendall in 1913 and by E. L. McNair in 1914 and are based on positions described in Bulletin 440:

ALBIA QUADRANGLE.

Along highways near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 72 N., Rs. 18 and 19 W., quarter corner secs. 25 and 30, 20 feet east of T road west, at north-south fence line, 5 feet north of fence line east	41 00 28.6	92 58 54.1	.....
T. 72 N., Rs. 18 and 19 W., about 0.25 mile south of corner secs. 24, 25, 19, and 30, 30 feet north and 15 feet east of T road east, near corner fence post, iron post stamped "Prim. Trav. Sta. No. 8, 1914, Iowa"	41 00 41.8	92 58 53.9	1,333
T. 72 N., Rs. 18 and 19 W., corner secs. 24, 25, 19, and 30, at T road west and in line with center of roads south and west, 15 feet west of road north	41 00 54.9	92 58 54.4	1,329
T. 72 N., Rs. 18 and 19 W., quarter corner secs. 24 and 19, center of north-south road	41 01 20.8	92 58 54.4	2,620
T. 72 N., Rs. 18 and 19 W., corner secs. 13, 24, 18 and 19, center of north-south road at east-west fence line (road is not used)	41 01 46.9	92 58 54.5	2,632
T. 72 N., Rs. 18 and 19 W., quarter corner secs. 13 and 18, center of old abandoned road at east-west fence line	41 02 12.8	92 58 54.8	2,625
T. 72 N., Rs. 18 and 19 W., corner secs. 12, 13, 7, and 18, in field and in line with east-west fence, and road south	41 02 38.8	92 58 54.9	2,634
T. 72 N., Rs. 18 and 19 W., approximately on range line and a few hundred feet north of quarter corner on east side sec. 12, east end of small wooden bridge over Whippoorwill Creek	41 03 12.3	92 58 54.8	3,385
T. 72 N., Rs. 18 and 19 W., in southeast quarter of sec. 1, and about 730 feet south of schoolhouse	41 03 47.6	92 59 23.5	4,190
T road west, several mail boxes on post at	41 04 09.6	92 59 22.0	2,228
T. 72 and 73 N., Rs. 18 and 19 W., corner secs. 1, 6, 31, and 36, in field at intersection of fences about 1,250 feet east of public road	41 04 26.3	92 58 55.2	2,670
T. 73 N., R. 19 W., in southeast quarter of sec. 25, public road crossing coal mine branch	41 05 33.7	92 59 13.7	6,966
T. 73 N., R. 19 W., in south half of sec. 25, about 60 feet north of T road east, center of small wooden bridge	41 05 38.5	92 59 29.7	1,319
T. 73 N., R. 19 W., at quarter corner secs. 24 and 25, center of north-south road at fence line east	41 06 10.5	92 59 30.0	3,240
T. 73 N., R. 19 W., in center of sec. 24, crossroads	41 06 36.4	92 59 30.1	2,620
T. 73 N., R. 19 W., quarter corner secs. 13 and 24, crossroads	41 07 02.7	92 59 30.2	2,660

Magnetic declination near west border of quadrangle, 7° 47′ E.

ATTICA QUADRANGLE.

Along highways near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Dallas, 1 mile north of, at northwest corner of William Clark's lot, 25 feet northwest to T road east, in top of sandstone 26 by 10 by 8 inches, 24 inches in ground; aluminum tablet stamped "Prim. Trav. Sta. No. 4, 1907, Iowa"	41 14 52.6	93 14 07.2	.....
Dallas, "Rock Island Ry." track under highway bridge at	41 13 58.8	93 14 28.7	5,689
Melcher station, east-west road crossing 0.25 mile north of	41 13 34.0	93 14 21.9	2,560
T. 74 N., R. 21 W., corner of secs. 10, 11, 14, and 15, in north-south road at hedge east	41 13 07.9	93 14 59.4	3,898
T. 74 N., R. 21 W., quarter corner between secs. 14 and 15, at crossroads	41 12 41.5	93 14 59.0	2,670
T. 74 N., R. 21 W., corner of secs. 14, 15, 22, and 23, 15 feet south to T road west	41 12 15.3	93 14 58.8	2,650
T. 74 N., R. 21 W., corner of secs. 22, 23, 26, and 27, at T road west	41 11 22.8	93 14 58.6	5,320
T. 74 N., R. 21 W., corner of secs. 26, 27, 34, and 35, at crossroads	41 10 30.5	93 14 58.1	5,290
Tps. 73 and 74 N., R. 21 W., corner of secs. 2, 3, 34, and 35, at crossroads, 30 feet northeast to corner of wire fence, 40 feet northwest to double elm	41 09 38.0	93 14 57.7	5,320
T. 73 N., R. 21 W., corner of secs. 2, 3, 10, and 11, at crossroads	41 08 45.1	93 14 57.3	5,350

Along highways near east border of quadrangle.

T. 73 N., R. 19 W., corner secs. 13, 14, 23, and 24, 15 feet south of T road north, on bank 2 feet from fence; iron post stamped "Prim. Trav. Sta. No. 9, 1914, Iowa"	41 07 02.5	93 00 04.3	.....
T. 73 N., R. 19 W., corner secs. 11, 12, 13, and 14, stone at corner of public crossroads	41 07 54.9	93 00 05.0	5,298
T. 73 N., R. 19 W., corner secs. 1, 2, 11, and 12, 660 feet south of schoolhouse, center of north-south road at fence line east	41 08 47.0	93 00 05.7	5,280
T. 73 N., R. 19 W., at quarter corner secs. 1 and 2, T road south	41 09 13.1	93 00 06.1	2,640
T. 73 N., R. 19 W., near center of sec. 2, at Eldorado Church, 15 feet south of T road north, 15 feet east of fence line south, close to east-west fence; iron post stamped "Prim. Trav. Sta. No. 10, 1914, Iowa, elevation 915"	41 09 12.8	93 00 40.5	2,634
Tps. 73 and 74 N., R. 19 W., quarter corner secs. 2 and 35, on line between Marion and Monroe counties, fences east-west	41 09 38.2	93 00 41.1	2,578
North Cedar Creek, center of covered wooden bridge over	41 10 39.2	93 00 43.1	6,174
T. 74 N., R. 19 W., about 0.25 mile south of corner secs. 22, 23, 26, and 27, 20 feet north and 20 feet west of T road north, inside corner of fence; iron post stamped "Prim. Trav. Sta. No. 11, 1914, Iowa, elevation 868"	41 11 09.9	93 01 13.0	3,854
T. 74 N., R. 19 W., corner secs. 22, 23, 26, and 27, stone at right angle in road, 20 feet east of center of road north, and in line with fence line north	41 11 22.8	93 01 15.4	1,315
T. 74 N., R. 19 W., stone at corner secs. 14, 15, 22, and 23, in "Indian Cemetery" in line with roads north, south, and west, 15 feet north of "Monroe monument"	41 12 15.1	93 01 15.4	5,287
Attica, center of public crossroads at	41 13 45.8	93 00 59.4	9,266
T. 74 N., R. 19 W., east of corner secs. 2, 3, 10, and 11, T road west	41 13 59.8	93 01 09.6	1,616
Prim. Trav. Sta. No. 2, 1908, Iowa (Bull. 440, p. 257)	41 14 53.3	93 01 16.9	5,442

Along highways through center of quadrangle.

T. 73 N., R. 19 W., corner secs. 14, 15, 22, and 23, center of east-west road at north-south fence	41 07 02.3	93 01 13.4	.....
T. 73 N., R. 19 W., quarter corner secs. 15 and 22, T road south	41 07 02.7	93 01 47.9	2,640
T. 73 N., R. 19 W., near corner secs. 15, 16, 21, and 22, 30 feet south and 25 feet east of stone corner at T road north, 1 foot from wire fence, 25 feet east of fence line south; iron post stamped "Prim. Trav. Sta. No. 12, 1914, Iowa, elevation 943"	41 07 03.0	93 02 21.6	2,581
T. 73 N., R. 19 W., quarter corner secs. 16 and 21, T road south	41 07 03.1	93 02 56.4	2,660
T. 73 N., R. 19 W., stone at corner secs. 16, 17, 20, and 21, T road north	41 07 02.8	93 03 30.9	2,645
T. 73 N., R. 19 W., quarter corner secs. 17 and 20, T road south	41 07 02.8	93 04 05.5	2,644
T. 73 N., R. 19 W., stone at corner secs, 17, 18, 19, and 20	41 07 02.3	93 04 39.5	2,603
T. 73 N., R. 19 W., quarter corner secs. 18 and 19, center of road west at north-south fences	41 07 03.1	93 05 13.8	2,625
T. 73 N., Rs. 19 and 20 W., approximately corner secs. 18, 19, 13, and 24, 20 feet east of level bench-mark post, near wire fence, at Monroe-Lucas county line	41 07 03.4	93 05 48.1	2,628
T. 73 N., R. 20 W., quarter corner secs. 23 and 24, T road east	41 06 37.1	93 06 56.5	5,874
T. 73 N., R. 20 W., in north half of sec. 23, road crossing	41 06 50.1	93 07 31.7	3,000
T. 73 N., R. 20 W., at crossing of line between secs. 22 and 23, center of east-west road	41 06 50.0	93 08 06.3	2,650

ATTICA QUADRANGLE—Continued.

Along highways through center of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 73 N., R. 20 W., 15 feet south and 40 feet west of T road south, in northeast quarter of sec. 22, 5 feet west of telephone pole with painted elevation, iron post stamped "Prim. Trav. Sta. No. 13, Iowa, elevation 986"	41 06 49.6	93 08 24.0	1,354
T. 73 N., R. 20 W., on sec. line between secs. 21 and 22, crossroads.	41 06 49.5	93 09 14.9	3,898
T. 73 N., R. 20 W., in northeast quarter of sec. 21, T road south	41 06 49.3	93 09 41.0	1,999
T. 73 N., R. 20 W., in northeast quarter of sec. 20, public crossroads.	41 06 49.1	93 10 13.5	2,484
T. 73 N., R. 20 W., 0.25 mile south of corner secs. 17, 18, 19, and 20, public crossroads	41 06 48.9	93 11 33.0	6,085
T. 73 N., R. 20 W., at quarter secs. 18 and 19, T road west	41 07 01.6	93 12 08.2	2,983
T. 73 N., Rs. 20 and 21 W., corner secs. 18, 19, 13, and 24, crossroads.	41 07 01.4	93 12 39.6	2,410
T. 73 N., R. 21 W., corner secs. 13, 14, 23, and 24, just west of schoolhouse in hollow, at fence line north, at east-west road	41 07 01.3	93 13 47.9	5,228
T. 73 N., R. 21 W., quarter corner secs. 14 and 23, angle in road, south and east	41 07 01.0	93 14 22.2	2,625
T. 73 N., R. 21 W., center sec. 23, T road west	41 06 34.6	93 14 22.1	2,665
T. 73 N., R. 21 W., quarter corner secs. 22 and 23, T road north	41 06 34.5	93 14 56.3	2,615
Along highways near south border of quadrangle.			
T. 72 N., Rs. 20 and 21 W., 30 feet south and 20 feet east of center of road crossing at corner secs. 25, 30, 36, and 31, 3 feet north of corner fence post; iron post stamped "Prim. Trav. Sta. No. 4, Iowa 1914, elevation 1036"	41 00 00.5	93 12 37.9	.....
T. 72 N., R. 20 W., quarter corner secs. 30 and 31, T road north	41 00 01.2	93 12 04.5	2,560
T. 72 N., R. 20 W., at corner secs. 29, 30, 31, and 32, public road crossing	41 00 01.7	93 11 29.7	2,670
T. 72 N., R. 20 W., at corner secs. 28, 29, 32, and 33, T road north	41 00 02.2	93 10 20.8	5,280
T. 72 N., R. 20 W., 30 feet east and 20 feet north of T road north, at corner secs. 27, 28, 33 and 34, 3 feet south of east-west hedge line; iron post stamped "Prim. Trav. Sta. No. 5, Iowa, 1914, elevation 1023"	41 00 02.7	93 09 11.8	5,290
T. 72 N., R. 20 W., corner secs. 26, 27, 34 and 35, center crossroads.	41 00 02.7	93 08 03.8	5,215
T. 72 N., R. 20 W., corner secs. 25, 26, 35 and 36, crossroads	41 00 02.8	93 06 55.3	5,255
T. 72 N., R. 20 W., 0.25 mile west of line between Rs. 19 and 20, 30 feet south and 30 feet east of T road corners on line between secs. 25 and 36, 5 feet east of corner fence post; iron post stamped "Prim. Trav. Sta. No. 6, 1914, Iowa, elevation 1012"	41 00 02.7	93 06 04.2	3,920
T. 72 N., Rs. 19 and 20 west, corner secs. 25, 30, 36 and 31, at Lucas-Monroe county line, in line with road north across small ravine, T road south	41 00 03.0	93 05 46.9	1,325
T. 72 N., R. 19 W., corner secs. 29, 30, 31 and 32, at fence line north-south, center of east-west road	41 00 03.1	93 04 38.1	5,215
T. 72 N., R 19 W., quarter corner secs. 29 and 32, T road north	41 00 03.0	93 04 04.5	2,635
T. 72 N., R. 19 W., corner secs. 28, 29, 32 and 33, stone in center of east-west road at fence line south	41 00 02.9	93 03 30.0	2,645
T. 72 N., R. 19 W., 40 feet north and 25 feet west of T road north, at quarter corner secs. 28 and 33, 4 feet north of corner fence post; iron post stamped "Prim. Trav. Sta. No. 7, 1914, Iowa, elevation 994"	41 00 03.2	93 02 55.8	2,623
T. 72 N., R. 19 W., corner secs. 27, 28, 33 and 34 east-west, road ta nor th-south fence line	41 00 02.8	93 02 21.0	2,670
T. 72 N., R. 19 W., quarter corner secs. 27 and 34, T road south	41 00 02 6	93 01 46.4	2,650
T. 72 N., R. 19 W., corner secs. 26, 27, 34 and 35, east-west road at hedge line north and fence line south	41 00 02.6	93 01 12.0	2,645
T. 72 N., R. 19 W., quarter corner secs. 26 and 35, angle of road north and west, in line with fence south, at schoolhouse	41 00 02.8	93 00 37.6	2,635
T. 72 N., R. 19 W., at crossing of line between secs. 25 and 26, T road south	41 00 15.5	93 00 03.2	2,929
Along highways near west border of quadrangle.			
T. 73 N., R. 21 W., at corner secs. 26, 27, 34 and 35, at hedge south and fence north, center of east-west road	41 05 16.8	93 14 56.7	.....
T. 73 N., R. 21 W., in northwest quarter of sec. 35, T road north	41 05 16.9	93 14 39.6	1,310
Tps. 72 and 73 N., R. 21 W., corner secs. 2, 3, 34 and 35, in line with fence north, T road south	41 04 24.9	93 14 56.9	5,426
T. 72 N., R. 21 W., at corner secs. 2, 3, 10 and 11, public crossroads.	41 03 27.6	93 14 55.3	5,798
T. 72 N., R. 21 W., corner secs. 10, 11, 14 and 15, north-south road at fence line east and hedge line west	41 02 35.6	93 14 55.6	5,270
T. 72 N., R. 21 W., 0.25 mile south of corner secs. 10, 11, 14 and 15, center of public road crossing	41 02 22.6	93 14 55.6	1,320
T. 72 N., R. 21 W., corner secs. 14, 15, 22 and 23, at fence line east-west, of north-south road	41 01 43.6	93 14 55.5	3,950
T. 72 N., R. 21 W., about 0.25 mile north of corner secs. 22, 23, 26 and 27, & road north	41 01 04.6	93 14 55.7	3,947
T. 72 N., R. 21 W., in south half sec. 23, T road south	41 01 05.0	93 14 21.4	2,628

Magnetic declination near north border of quadrangle, 7° 31′ E.; near south border, 7° 45′ E.; near east border, 7° 47′ E.; near west border, 7° 42′ E.; near center, 7° 55′ E.

CHARITON QUADRANGLE.

Along highways near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 73 N., R. 21 W., secs. 15, 16, 21, and 22, stone, corner of, 12 feet north and 25 feet west of; 50 feet east of the southeast corner of Renfrow schoolhouse; iron bench mark post stamped "Prim. Trav. Sta. No. 1, 1913, Iowa, elevation 993"	41 07 01.1	93 16 05.6	.....
T. 73 N., R. 21 W., near quarter corner secs. 21 and 22, at road forks, center of small bridge	41 06 34.8	93 16 04.0	2,660
T. 73 N., R. 21 W., center of sec. 22, T road forks	41 06 34.6	93 15 30.6	2,559
T. 73 N., R. 21 W., quarter corner secs. 22 and 27, north-south road at east-west fence line	41 06 08.8	93 15 30.7	2,615
T. 73 N., R. 21 W., quarter corner secs. 27 and 34, at "Central Church," T road north	41 05 16.6	93 15 30.8	5,275
Williamson station, about 400 feet south of, public road crossing at center of main track of Chicago, Rock Island & Pacific R. R.	41 05 16.8	93 15 10.7	1,540

Along highways east-west through center of quadrangle.

T. 73 N., R. 21 W., corner of secs. 2, 3, 10, and 11, at crossroads (duplicate)	41 08 45.1	93 14 57.3	.....
T. 73 N., R. 21 W., corner of secs. 3, 4, 9, and 10, at crossroads, near church and schoolhouse	41 08 45.4	93 16 06.2	5,267
T. 73 N., R. 21 W., stone corner of secs. 9, 10, 15, and 16, at crossroads	41 07 53.1	93 16 05.5	5,288
T. 73 N., R. 21 W., stone corner of secs. 15, 16, 21, and 22, 12 feet north and 25 feet west of, 50 feet east of the southeast corner of Renfrow schoolhouse; iron bench mark post stamped "Prim. Trav. Sta. No. 1, 1913, Iowa, elevation 993"	41 07 01.1	93 16 05.6	5,268
T. 73 N., R. 21 W., corner of secs. 16, 17, 20, and 21, in east-west road at wire fence north, 770 feet east of crossroads	41 07 01.2	93 17 15.4	5,340
T. 73 N., R. 21 W., corner of secs. 16, 17, 20, and 21, 770 feet west of; four corners	41 07 00.9	93 17 25.4	769
Schoolhouse, T road south at	41 07 00.3	93 18 06.0	3,111
T 73 N., R. 21 W., corner of secs. 17, 18, 19, and 20, at fences north and south, 0.25 mile west of T road south	41 07 00.2	93 18 23.3	1,320
T. 73 N., R. 21 W., quarter corner between secs. 18 and 19, at crossroads opposite mail box and 50 feet northwest of culvert	41 07 00.2	93 18 58.0	2,660
T. 73 N., Rs. 21 and 22 W., corner of secs. 13, 18, 19, and 24, at north-south fences and 0.25 mile east of T road north	41 07 00.2	93 19 33.3	2,700
T. 73 N., R. 22 W., quarter corner between secs. 13 and 24, 15 feet south and 20 feet east of, in southeast corner of T road south; iron post stamped "Prim. Trav. Sta. No. 2, 1913, Iowa"	41 06 59.6	93 20 07.6	2,625
T. 73 N., R. 22 W., quarter corner between secs. 14 and 23, at T road east, 1.25 miles north of Oakley	41 06 59.6	93 21 17.0	5,310
Oakley, 1.2 miles north of; iron bridge over White Breast Creek	41 07 06.7	93 21 45.7	2,316
T. 73 N., R. 22 W., 40-acre corner of secs. 14, 15, 22, and 23, 0.25 mile north of, at T road west, 750 feet northwest of bridge	41 07 12.1	93 21 51.8	716
T. 73 N., R. 22 W., corner of 40-acre corner of secs. 15, 16, 21, and 22, 0.25 mile north of, at crossroads	41 07 11.8	93 23 00.3	5,245
T. 73 N., R. 22 W., quarter corner between secs. 16 and 17, 15 feet south and 15 feet west of, inside of wire fence, in southwest corner of a 90° bend in road from north to west; iron post stamped "Prim. Trav. Sta. No. 3, 1913, Iowa, elevation 963"	41 07 23.8	93 24 09.3	5,421
T. 73 N., R. 22 W., quarter corner stone between secs. 17 and 18, at crossroads	41 07 25.8	93 25 17.6	5,230
T. 73 N., Rs. 22 and 23 W., quarter corner between secs. 13 and 18, at crossroads	41 07 25.8	93 26 24.6	5,130
T. 73 N., R. 23 W., secs. 13, 14, 23, and 24, corner of T road west at	41 07 00.1	93 27 33.8	5,904
T. 73 N., R. 23 W., quarter corner between secs. 14 and 23, 30 feet north of, on north edge of east and west road, on line with center of T road south and at southeast corner of schoolhouse yard; ironpost stamped "Prim. Trav. Sta. No. 4, 1913, Iowa, elevation 1037"	41 07 00.5	93 28 08.4	2,655
T. 73 N., R. 23 W., corner of secs. 14, 15, 22, and 23, at T road north at Norwood, 50 feet northwest to store	41 07 00.1	93 28 43.1	2,650

CHARITON QUADRANGLE—Continued.

Along highways near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 73 N., R. 23 W., corner of secs. 10, 11, 14, and 15, at crossroads north of church, 1 mile north of Norwood	41 07 52.2	93 28 43.6	5,270
T. 73 N., R. 23 W., 30 feet south and 30 feet west of corner of secs. 2, 3, 10, and 11, in southwest corner of crossroads 2 miles north of Norwood; iron post stamped "Prim. Trav. Sta. No. 5, 1913, Iowa, elevation 1023"	41 08 44.0	93 28 44.2	5,235
T. 73 N., R. 23 W., quarter corner between secs. 3 and 4, at crossroads	41 09 10.9	93 29 53.5	5,960
T. 74 N., R. 23 W., corner of secs. 3, 4, 33, and 34, at T road west, also line between Lucas and Warren counties	41 09 38.7	93 29 53.8	2,809
T. 74 N., R. 23 W., corner of secs. 33, 34, 27, and 28, at crossroads, near schoolhouse	41 10 31.2	93 29 54.2	5,320
T. 74 N., R. 23 W., corner of secs. 21, 22, 27, and 28, at hedges east and west	41 11 23.6	93 29 54.3	5,300
Liberty Center, T. 73 N., R. 23 W., corner of secs. 15, 16, 21, and 22, 40 feet north and 25 feet west of, in northwest corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 6, 1913, Iowa"	41 12 16.8	93 29 54.9	5,370
T 74 N., R. 23 W., corner stone of secs. 9, 10, 15, and 16, at crossroads	41 13 08.9	93 29 55.3	5,290
T. 74 N., R. 23 W., corner of secs. 3, 4, 9, and 10, at crossroads, near schoolhouse	41 14 01.5	93 29 55.8	5,320
Tps. 74 and 75 N., R. 23 W., corner of secs. 3, 4, 33, and 34, 25 feet south and 60 feet east of, in the northwest corner of sec. 3, in the southeast corner of public crossroads; aluminum tablet stamped "Prim. Trav. Sta. No. 6, 1907, Iowa, elevation 937"	41 14 52.5	93 29 54.8	5,151

Along highways near south border of quadrangle.

T. 72 N., R. 21 W., on line between secs. 27 and 28, at fence lines north-south, center of public road	41 00 06.5	93 16 04.2	.....
T. 72 N., R. 21 W., approximately quarter corner secs. 28 and 29, about 5 feet north of center of public road	41 00 25.1	93 17 13.3	5,616
Chariton, crossing of South Avenue and Fourth Street, near middle of sec. 29	41 00 26.6	93 17 48.2	2,680
T. 72 N., R. 21 W., corner secs. 19, 20, 29, and 30, at intersection of Main Street and Court Avenue, at southwest corner of public square. (Corner is said to be at intersection of property line on east side of Main Street and north side of Court Avenue)	41 00 51.4	93 18 22.6	3,641
Chariton, 130 feet southwest of southwest corner of courthouse, 33 feet east of curbing on Main Street, and 12 feet north of curbing on Court Avenue; iron post stamped "Prim. Trav. Sta. No. 1, 1914, Iowa"	41 00 51.8	93 18 21.9	66

On highway near southwest corner of quadrangle.

White Breast Creek, center of iron bridge over	41 00 11.7	93 29 58.5	.....

Along highways near west border of quadrangle.

[Circuit closed in 1914 by E. L. McNair.]

T. b. m. No. 4, 1913, Iowa (duplicate)	41 07 00.5	93 28 08.4	.....
Norwood, ¾ mile west of, T road south	41 06 57.2	93 29 35.1	6,646
Otter Creek, iron bridge over	41 06 16.5	93 29 37.4	4,125
T. 73 N., R. 23 W., secs. 27, 28, 33, and 34, corner of, at crossroads	41 05 16.4	93 29 52.4	6,198
Tps. 72 and 73 N., R. 23 W., secs. 3, 4, 33, and 34, corner of; corner is near scrub-oak 10 feet east of road at top of hill, at wire fence east.	41 04 24.0	93 29 52.2	5,298
Iron bridge over Otter Creek, T road north 450 feet west of	41 04 09.7	93 30 44.3	4,250

Magnetic declination near east border of quadrangle, 7° 42′ E.; near west border, 8° 19′ E.; near center, 7° 53′ E.; near south border, 7° 32′ E.; near north border, 7° 49′ E.

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HUMESTON QUADRANGLE.

Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 72 N., Rs. 21 and 22 W., corner secs. 25, 30, 31, and 36, at east-west fence line, center of north-south road	40 59 58.9	93 19 32.9	.....
Tps. 71 and 72 N., R. 22 W., at quarter corner between secs. 1 and 36, T road west	40 59 06.8	93 20 06.9	5,886
Tps. 71 and 72 N., R. 22 W., corner secs. 1, 2, 35, and 36, at fence line south, center of east-west road	40 59 06.6	93 20 41.3	2,630
Chariton River, center of iron bridge over	40 59 06.6	93 21 10.8	2,260
Tps. 71 and 72 N., R. 22 W., corner secs. 2, 3, 34, and 35, 60 feet east and 20 feet north of T road corners, 30 feet east of fence corner on bank close to wire fence; iron post stamped "Prim. Trav. Sta. No. 2, 1914, Iowa"	40 59 06.6	93 21 49.3	2,950
Tps. 71 and 72 N., R. 22 W., quarter corner secs. 3 and 34; T road south	40 59 06.2	93 22 24.6	2,709
Tps. 71 and 72 N., R. 22 W., at corner secs. 3, 4, 33, and 34; cross-roads. (A stone, apparently section corner, is about 20 feet north on line of east-west fence)	40 59 05.9	93 22 58.9	2,625
Tps. 71 and 72 N., R. 22 W., corner secs. 32, 33, 4, and 5; T road east	40 59 05.7	93 24 07.4	5,250
Tps. 71 and 72 N., R. 22 W., about 0.25 mile south of corner secs. 31, 32, 5, and 6; T road east	40 58 49.0	93 25 16.1	5,529
T. 71 N., R. 22 W., at corner secs. 5, 6, 7, and 8; crossroads	40 58 09.6	93 25 15.4	3,985
T. 71 N., Rs. 22 and 23 W., at corner secs. 6, 7, 1, and 12; T road south	40 58 09.7	93 26 25.6	5,380
T. 71 N., R. 23 W., at corner secs. 1, 2, 11, and 12; T road south	40 58 11.1	93 27 34.4	5,280
T. 71 N., R. 23 W., 50 feet west and 35 feet south of crossroads at quarter corner secs. 2 and 11, on top of bank, no fence; iron post stamped "Prim. Trav. Sta. No. 3, 1914, Iowa"	40 58 10.7	93 28 09.3	2,668
Tps. 71 and 72 N., R. 23 W., at apparent quarter corner secs. 2 and 35; T road west	40 59 04.9	93 28 08.8	5,480
T. 72 N., R. 23 W., in north half sec. 35; T road south	40 59 45.7	93 28 08.5	4,132
T. 72 N., R. 23 W., in northeast quarter sec. 34; T road north	40 59 45.8	93 29 00.5	3,980
T. 72 N., R. 23 W., near quarter corner on west side sec. 34, at schoolhouse; T road north	40 59 46.0	93 29 52.6	3,993
T. 72 N., R. 23 W., approximately corner secs. 27, 23, 33, and 34, opposite fence line east; center of north-south road	40 59 59.7	93 29 52.7	1,390

Magnetic declination near north border of quadrangle, 7° 32′ E.

MELROSE QUADRANGLE.

Along highways near northwest corner of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ″	° ′ ″	*Feet.*
T. 72 N., R. 21 W., about 360 feet west of quarter corner secs. 26 and 35, about 100 feet east of road bridge, about 10 feet south of center of east-west road, T road south	40 59 59.7	93 14 26.0	.....
T. 72 N., R. 21 W., at corner secs. 26, 27, 34, and 35, T road corners east-west-south	40 59 59.6	93 14 55.4	2,250

Magnetic declination near north border of quadrangle, 7° 45′ E.

NEW VIRGINIA QUADRANGLE.

Along highways near east border of southeast quarter of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 72 N., R. 23 W., on line between secs. 21 and 28; T road west	41 00 50.9	93 30 08.5	.....
Chicago, Burlington & Quincy R. R., public crossroads; 100 feet south of crossing	41 01 17.1	93 30 08.6	2,653
T. 72 N., R. 23 W., corner secs. 16, 17, 20, and 21; stone at crossroads	41 01 43.4	93 31 00.2	4,761
T. 72 N., R. 23 W., corner secs. 8, 9, 16, and 17; stone at T road south	41 02 35.4	93 30 59.4	5,270
T. 72 N., R. 23 W., near center northwest quarter sec. 9, 25 feet south and 12 feet west of center of east-west road, at T road south, 200 feet northeast of Palestine public school; iron post stamped "Prim. Trav. Sta. No. 7, 1913, Iowa" (tie with McNair's 1914 line)	41 03 13.9	93 30 43.6	4,082
T. 72 N., R. 23 W., corner secs. 4, 5, 8, and 9; at cross hedges	41 03 27.5	93 31 00.1	1,868
Otter Creek, 450 feet west of iron bridge over	41 04 09.7	93 30 44.3	4,438

Magnetic declination near east border of quadrangle, 8° 19′ E.

MISSOURI.

PRIMARY TRAVERSE.

Crystal City quadrangle.

JEFFERSON COUNTY.

The geographic positions in the following list were determined by J. H. Wilson in 1913 and are based on primary traverse run in 1903, described in Bulletin 245, and Mississippi River Commission triangulation stations Joachim and Simpson 55, on approximate North American datum.

CRYSTAL CITY QUADRANGLE.

Along highways near northwest corner of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Joachim Bluff, on first prominent rock point below, 1,000 meters below town of Herculaneum, 20 feet outside of east rail of Mississippi River and Bonne Terre Ry., 36.5 feet from cross cut on rock about 10 feet south of normal from pipe to rail, 15 feet west of rail, 64.9 feet from cross in rock upstream (distance between crosses is 62 feet); iron pipe (Mississippi River Commission triangulation station Joachim)	38 15 11.0	90 22 12.5	.....
Road crossing	38 14 03.7	90 22 13.7	6,811
Festus, 300 feet west of station, north-south road crossing St. Louis & San Francisco R. R	38 13 25.4	90 23 37.4	7,722
Silica Junction, 1,000 feet northwest of; road crossing St. Louis & San Francisco R. R	38 13 49.1	90 25 03.7	7,292
Silica, road crossing St. Louis, Iron Mountain & Southern Ry	38 14 05.5	90 25 33.6	2,909
Forks of road	38 14 12.9	90 26 29.3	4,508
T road south of section line	38 14 13.5	90 28 04.2	7,576
Road forks almost in front of house	38 14 21.4	90 28 18.9	1,419
T road east	38 14 43.3	90 28 43.6	2,971

Along highways near west border of quadrangle.

T. 41 N., R. 5 E., corner of secs. 28, 29, 32, and 33; southwest corner of cemetery	38 14 56.3	90 28 53.2	1,523
Zion schoolhouse, southeast corner of yard; iron post stamped "Prim. Trav. Sta. No. 1, 1913"	38 14 56.2	90 29 00.6	596
T. 41 N., R. 5 E., south corner of secs. 32 and 33	38 14 02.9	90 28 54.0	5,417
Center of road at top of ridge, gate on west side of road, 500 feet north of second-class road fork	38 13 15.1	90 29 12.6	5,063
Hematite, at station, road crossing St. Louis, Iron Mountain & Southern Ry	38 12 10.1	90 28 42.6	6,992
Hematite, near, wagon road at east edge of ford over Swashon Creek	38 11 51.5	90 28 51.1	2,009
Swashon Creek, 900 feet east of; road forks	38 11 34.4	90 28 56.4	1,787
Beckler's house, 600 feet northwest of; road forks in creek bottom	38 10 44.1	90 28 20.9	5,823
T. 40 N., R. 5 E., 0.25 mile west of quarter corner between secs. 27 and 28; T road east on quarter section line	38 10 02.7	90 28 07.4	4,322
Center of crossroads	38 09 48.8	90 28 08.0	1,410
T. 40 N., R. 5 E., corner of secs. 27, 28, 33, and 34	38 09 36.3	90 27 51.7	1,817
T. 39 N., R. 5 E., north corner of secs. 3 and 4 (570 feet east of preceding position is stone at south corner of secs. 33 and 34, T. 40 N., R. 5 E., 280 feet west of road forks)	38 08 43.4	90 28 01.3	5,402
Plattin, 4 miles from, 25 feet south by 20 feet west of intersection of crossroads, at southwest corner of crossroads, near signpost "De Soto 6 mi., Plattin 4 mi., Crystal City 8 mi"; iron post stamped "Prim. Trav. Sta. No. 2, 1913"	38 07 38.5	90 28 22.9	6,792
Lutheran Church, just west of; road forks	38 06 20.0	90 29 03.2	8,580
T. 39 N., R. 5 E., corner of secs. 16, 17, 20, and 21; (corner not found and position is only approximate)	38 05 11.5	90 29 19.8	7,049

CRYSTAL CITY QUADRANGLE—Continued.

Along highways near west border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T road west just south of creek	38 05 02.8	90 29 20.0	890
T. 39 N., R. 5 E., corner of secs. 20, 21, 28, and 29, 10 feet north of small wooden bridge; center of north-south road	38 04 19.1	90 29 22.3	4,423
Valles Mines, 1.5 miles north of, in front of small house on top of ridge; T road south	38 03 48.0	90 29 35.6	3,328
Milepost 20, just northeast of, road crossing Mississippi River & Bonne Terre Ry	38 03 02.6	90 29 29.4	4,618
Valles Mines, east-west road crossing Mississippi River & Bonne Terre Ry. (old position)	38 02 29.3	90 29 51.3	3,804
Valles Mines, 50 feet west of Mississippi River & Bonne Terre Ry. at east-west road crossing; iron post stamped "Prim. Trav. Sta. No. 3, 1913, elev. 745"	38 02 29.6	90 29 51.9	55

Along highways east-west through center of east half of quadrangle.

Plattin, 50 feet north of station; road crossing Mississippi River & Bonne Terre Ry. (old position)	38 07 52.9	90 24 38.6	.....
Forks of road 60 feet east of B. W. McCormack's mail box	38 07 41.2	90 24 04.0	3,016
T road south, 240 feet west of where road crosses top of ridge, in front of small house	38 07 27.2	90 23 10.5	4,511
Forks of road, near J. N. Sherman's mail box	38 07 30.0	90 22 09.4	4,897
Road forks, south end of cut-off	38 07 40.1	90 21 31.0	3,244
T road east at G. Holzhausen's stock farm	38 08 47.2	90 21 42.8	6,839
T. 40 N., R. 6 E., south corner of secs. 33 and 34	38 08 35.5	90 21 10.8	2,820
Forks of road, 110 feet west of J. T. Becker's mail box	38 08 43.4	90 20 39.0	2,671
South end of bridge over Muddy Creek	38 08 33.8	90 20 11.4	2,418
T. 39 N., R. 6 E., north corner of secs. 2 and 3	38 08 34.4	90 20 05.1	508
T. 39 N., R. 6 E., north corner of secs. 1 and 2	38 08 34.0	90 19 16.6	3,883
West end of bridge over Muddy Creek just west of road forks at Church	38 08 18.8	90 19 00.9	1,993
Rush Tower, 0.8 mile west of; T road northwest	38 08 40.5	90 18 14.3	4,328
Rush Tower, on bluff north of, 20 feet northwest of old location of shot tower, 275 meters northwest of railroad trestle over Muddy Creek, in Missouri Bluffs; iron pin leaded into rock (Mississippi River Commission triangulation station Simpson 55)	38 08 59.06	90 17 33.21	3,785

Magnetic declination for northwest corner of quadrangle, 6° 54′ E.; for west border, 7° 09′ E.; for center line east-west through east half, 6° 18′ E.

De Soto, Kimmswick, and St. Louis quadrangles.

JEFFERSON COUNTY.

The geographic positions in the following list were determined by J. H. Wilson in 1913 and are based on primary traverse position at Fenton, determined in 1903, and primary traverse station No. 1, the position of which was determined by Wilson in 1913, on approximate North American datum.

DE SOTO QUADRANGLE.

Along highways near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Goldman, 1.8 miles northeast of, on top of Sandy Ridge; T road east	38 18 45.8	90 30 06.2	.....
Antonia, 2 miles west of, 1,050 feet north of St. Paul's Church, 15 feet north by 30 feet west of center of triangle at road forks, just inside of fence; iron post stamped "Prim. Trav. Sta. No. 5, 1913, elev. 881"	38 22 20.8	90 30 02.7	.....

KIMMSWICK QUADRANGLE.

Along highways near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 41 N., R. 5 E., corner of secs. 20, 21, 28, and 29	38 15 49.5	90 28 51.4	
T road north, 140 feet west of, 30 feet north by 15 feet east of mail box; T road south	38 16 02.1	90 29 06.8	1,772
Sandy Church, 600 feet northwest of; fork in road	38 17 01.9	90 29 07.6	6,060
John Dittner's mail box, 20 feet west of; T road north	38 17 05.7	90 29 52.0	3,563
Sandy Ridge, 0.6 mile southwest of, 140 feet south of small wooden bridge, near corner of wire fence; road forks	38 18 05.7	90 29 39.8	6,150
Sandy Ridge, southeast corner of field, large stump used as a corner fence post	38 18 37.0	90 29 32.4	3,223
Road forks, 60 feet northeast of, wheel holding 7 mail boxes	38 19 46.2	90 29 45.1	
Antonia school, 0.5 mile southwest of, near F. Ullrich's and four other mail boxes; road forks	38 20 24.6	90 29 08.2	4,869
Antonia school; road forks at	38 20 47.2	90 28 55.4	2,508
Antonia, northwest corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 4, 1913"	38 21 46.5	90 27 56.8	7,601
T. 42 N., R. 5 E., corner of secs. 16, 17, 20, and 21	38 22 06.6	90 28 35.4	3,692
Antonia, 2 miles west of, 1,050 feet north of St. Paul's Church, 15 feet north by 30 feet west of center of triangle at road forks; just inside of fence; iron post stamped "Prim. Trav. Sta. No. 5, 1913, elev. 881"	38 22 20.8	90 30 02.7	7,100
Top of ridge, 250 feet southwest of house; fork in road	38 23 09.2	90 29 56.0	4,925
Road forks, on tree in center of triangle Nessel's mail box	38 23 34.7	90 29 47.0	2,677
Rock Creek Ford, road at	38 24 49.4	90 29 22.8	7,807
Leicht schoolhouse, 500 feet southwest of, 100 feet west of small house, 50 feet east of six mail boxes, center of triangle at road forks; top of hill	38 26 15.7	90 29 23.5	8,734
Mr. M. Werner's mail box, 70 feet southwest of, road forks	38 27 26.6	90 29 18.8	7,183
Four mail boxes, 40 feet northeast of; center of triangle at road forks	38 28 16.9	90 28 32.6	6,281
T. 43 N., R. 5 E., quarter corner in center of sec. 8, 30 feet south of T road (west) at Bowles schoolhouse	38 28 45.6	90 29 00.6	3,664
Murphy, road forks at	38 29 24.6	90 29 13.2	4,080
Fenton, 2 miles southwest of, about 300 feet northeast of T road southeast; main road at road forks	38 29 58.5	90 27 56.9	6,967

Magnetic declination for west border of quadrangle 5° 18′ E.; for west half of south border of quadrangle 6° 54′ E.

ST. LOUIS QUADRANGLE.

Along highways near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Fenton, 1 mile southwest of; T road southeast	38 30 29.4	90 27 07.9	5,000
Fenton, four corners at (old position)	38 30 47.2	90 26 08.6	5,043

Boynton, Braymer, Chillicothe, Chula, Dawn, Gallatin, Galt, Gower, Green City, Hale, Lucerne, Maysville, Milan, Plattsburg, Polo, Winigan, and Winston quadrangles.

CALDWELL, CLINTON, DAVIESS, DEKALB, GRUNDY, AND SULLIVAN COUNTIES.

The geographic positions on approximate North American datum in the following list were determined by E. L. McNair in 1913.

The line starts at primary traverse station No. 5 located in 1911, at the southwest corner of the Plattsburg quadrangle, described in Bulletin 551, and runs north and east near borders of quadrangles and is tied to primary traverse station No. 9, 1910, near the northwest

corner of the Winigan quadrangle, described in Bulletin 496. The line was double chained and the closure error at primary traverse station No. 9 was plus 29 feet in latitude and minus 12 feet in longitude. This error was distributed along the line through 158 computed positions.

From this double-chained line, single lines were run by McNair in the Braymer, Chillicothe, Chula, Dawn, Gallatin, and Hale quadrangles.

BOYNTON QUADRANGLE.

Along highways near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 63 N., R. 21 W., stone at quarter corner between secs. 15 and 22.	40 15 14.18	93 14 37.99	.....
T. 63 N., R. 21 W., corner of secs. 14, 15, 22, and 23, 10 feet north by 20 feet east of center of road north, 3 feet south of corner fence post; iron post stamped "Prim. Trav. Sta. No. 16 Mo., 1913"..	40 15 14.32	93 14 03.71	2,658
T. 63 N., R. 20 W., corner of secs. 16, 17, 20, and 21, road is 1,335 feet east of corner	40 15 18.11	93 09 37.33	.....
T road east	40 15 27.58	93 09 55.16	1,683
Milan, 4 miles north of, in northeast quarter of sec. 21, T. 63 N., R. 20 W., at forks of road, on west side of road, 1 foot from telephone pole at fence corner; iron post stamped "Prim. Trav. Sta. No. 17 Mo." (From bench-mark post Milan water tower is in azimuth 340° 28′ 46″)	40 15 04.35	93 08 45.85	5,866
T. 63 N., R. 20 W., corner of secs. 15, 16, 21, and 22; center of east-west road	40 15 18.45	93 08 28.17	1,980
T. 63 N., R. 20 W., stone at corner of secs. 14, 15, 22, and 23; cross-roads	40 15 19.32	93 07 19.76	5,305
T. 63 N., R. 20 W., corner of secs. 13, 14, 23, and 24 (1,495 feet west of preceding position is T road north; T road south is 215 feet east).	40 15 19.80	93 06 10.82	5,346
T. 63 N., R. 20 W., sec. 13; public road crossing Chicago, Burlington & Quincy R. R	40 15 33.62	93 05 11.17	4,832
T. 63 N., R. 19 W., corner of secs. 17, 18, 19, and 20; T road north..	40 15 18.91	93 03 50.94	6,397
T. 63 N., R. 19 W., corner of secs. 16, 17, 20, and 21; T road west..	40 15 18.40	93 02 42.80	5,284
T. 63 N., R. 19 W., in north quarter of sec. 22; T road east	40 15 00.58	93 00 45.03	.....

Magnetic declination for south border of quadrangle, 7° 38′ E.

BRAYMER QUADRANGLE.

Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 57 N., R. 25 W., west corner of secs. 18 and 19; T road east	39 44 33.8	93 45 32.8	.....
T. 57 N., R. 25 W., apparent east corner of secs. 13 and 24; stone; T road west	39 44 30.1	93 45 32.8	370
T. 57 N., R. 26 W., corner of secs. 13, 14, 23, and 24; T road east...	39 44 31.6	93 46 39.2	5,195
T road east, stone on north-south line between secs. 14 and 15	39 44 45.8	93 47 47.0	5,487
T. 57 N., R. 27 W., stone at quarter corner between secs. 14 and 23.	39 44 36.4	93 53 54.0	.....
T. 57 N., R. 27 W., stone at corner of secs. 14, 15, 22, and 23; cross-roads	39 44 36.7	93 54 27.7	2,635
T. 57 N., R. 27 W., corner of secs. 15, 16, 21, and 22; crossroads....	39 44 35.6	93 55 35.9	5,330
T. 57 N., R. 27 W., corner of secs. 16, 17, 20, and 21; T road south..	39 44 35.0	93 56 42.9	5,230
T. 57 N., R. 27 W., corner of secs. 17, 18, 19, and 20; crossroads....	39 44 34.3	93 57 50.8	5,311
T. 57 N., R. 27 W., apparent east corner of secs. 13 and 24 (the apparent west corner of secs. 18 and 19, T. 57 N., R. 27 W., is 40 feet south of preceding position)	39 44 33.8	93 59 02.0	5,559

Magnetic declination of north border of quadrangle, 8° 25′ E.

CHILLICOTHE QUADRANGLE.

Along highways and Chicago, Rock Island & Pacific Ry. near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 60 N., R. 25 W., 1.5 feet north of quarter corner between secs. 19 and 20; iron post stamped "Prim. Trav. Sta. No. 10 Mo., 1913".	39 59 46.24	93 44 41.44	.....
T. 60 N., R. 25 W., quarter corner between secs. 20 and 21; T road south	39 59 47.45	93 43 34.99	5,174
Center of Chicago, Rock Island & Pacific Ry. track	39 59 42.67	93 42 57.40	2,965
Public road crossing Chicago, Rock Island & Pacific Ry	39 59 54.92	93 41 55.01	5,012
Hickory Creek station, center of Chicago, Rock Island & Pacific Ry. track opposite semaphore	39 59 59.56	93 40 00.82	8,899
Public road crossing Chicago, Rock Island & Pacific Ry	39 59 52.53	93 38 46.26	5,847
T. 60 N., R. 24 W., quarter corner between secs. 19 and 20; T road north	39 59 56.72	93 38 12.16	2,688
Iron bridge over Grand River; center	39 59 45.81	93 36 48.65	6,593
T. 60 N., R. 24 W., in southeast quarter of sec. 21, opposite road north and on south side of east-west road, 1 foot from wire fence, 3 feet west of gatepost, at T road north; iron post stamped "Prim. Trav. Sta. No. 11 Mo., 1913"	39 59 46.30	93 36 11.53	2,890
T. 60 N., R. 24 W., stone at corner of secs. 22, 23, 26, and 27; T road east	39 59 35.07	93 34 46.10	6,746
T. 60 N., R. 24 W., corner of secs. 23, 24, 25, and 26	39 59 36.71	93 33 38.37	5,275
T. 60 N., R. 24 W., east corner of secs. 24 and 25; T road west (the west corner of secs. 19 and 30, T. 60 N., R. 23 W. is 90 feet north of preceding position)	39 59 37.65	93 32 29.94	5,328
T. 60 N., R. 23 W., corner of secs. 20, 21, 28, and 29; crossroads	39 59 40.29	93 30 08.11	11,044

Magnetic declination for north border of quadrangle, 6° 56′ E.

Along highways near west border of quadrangle.

T. 57 N., R. 25 W., corner of secs. 7, 8, 17, and 18	39 45 27.9	93 44 29.2	.....
T. 57 N., R. 25 W., apparent quarter corner between secs. 8 and 17, T road west, the quarter corner stone is 20 feet west by 5 feet north of the T road	39 45 27.3	93 43 54.7	2,686
T. 57 N., R. 25 W., quarter corner between secs. 5 and 8; crossroads	39 46 19.5	93 43 54.6	5,284
T. 57 N., R. 25 W., corner of secs. 4, 5, 8, and 9; T road south	39 46 19.2	93 43 20.7	2,640
Grand River, iron span bridge over; center	39 46 37.6	93 42 48.9	3,105
Tps. 57 and 58 N., R. 25 W., stone at corner of secs. 3, 4, 33, and 34; T road north. (There is a long section in next 2 miles)	39 47 11.1	93 42 21.6	4,000
Sampsel station, 600 feet east of, center of track—azimuth of tangent at this point 121° 13′—(1,510 feet south of preceding position is T road east at quarter corner between secs. 27 and 28)	39 48 49.0	93 42 20.1	9,910
T. 58 N., R. 25 W., corner of secs. 21, 22, 27, and 28; T road east	39 49 00.2	93 42 20.0	1,135
T road west	39 49 46.1	93 42 19.6	4,640
T. 58 N., R. 25 W., corner of secs. 15, 16, 21, and 22	39 49 52.5	93 42 19.5	650
T. 58 N., R. 25 W., quarter corner between secs. 15 and 16; T road south	39 50 18.6	93 42 19.4	2,640
T. 58 N., R. 25 W., quarter corner between secs. 16 and 17; cross-roads	39 50 18.8	93 43 27.2	5,290
T. 58 N., R. 25 W., stone at corner of secs. 8, 9, 16, and 17; in fence corner	39 50 44.8	93 43 26.8	2,634
T. 58 N., R. 25 W., quarter corner between secs. 8 and 9; cross-roads	39 51 11.0	93 43 26.6	2,647
T. 58 N., R. 25 W., corner of secs. 4, 5, 8, and 9; crossroads	39 51 36.9	93 43 26.4	2,625
Tps. 58 and 59 N., R. 25 W., corner of secs. 4, 5, 32, and 33	39 52 23.7	93 43 26.2	4,730
Tps. 58 and 59 N., R. 25 W., corner of secs. 5, 6, 31, and 32; T road south	39 52 22.2	93 44 36.2	.....
T. 59 N., R. 25 W., corner of secs. 28, 29, 32, and 33	39 53 16.3	93 43 26.4	7,728
T. 59 N., R. 25 W., quarter corner between secs. 28 and 29; T road west	39 53 42.1	93 43 26.4	2,610
T. 59 N., R. 25 W., corner of secs. 20, 21, 28, and 29; T road south	39 54 08.5	93 43 26.4	2,670
T. 59 N., R. 25 W., corner of secs. 16, 17, 20, and 21	39 55 01.3	93 43 26.8	5,340
T. 59 N., R. 25 W., corner of secs. 8, 9, 16, and 17; right angle in road	39 55 53.2	93 43 27.6	5,251
T. 59 N., R. 25 W., quarter corner between secs. 8 and 9; T road north	39 56 19.5	93 43 28.2	2,661
T. 59 N., R. 25 W., corner of secs. 4, 5, 8, and 9; T road west	39 56 45.7	93 43 28.7	2,650
T. 59 N., R. 25 W., 0.25 mile east of corner of secs. 5, 6, 7, and 8; right angle in road	39 56 44.3	93 44 19.2	3,935
T. 59 N., R. 25 W., 0.25 mile east of northwest corner of sec. 5; T road south, Grundy-Livingston county line	39 57 36.0	93 44 19.8	5,230
T. 60 N., R. 25 W., south corner of secs. 31 and 32; T road north, county line	39 57 35.8	93 44 41.0	1,650
T. 60 N., R. 25 W., stone at quarter corner between secs. 31 and 32	39 58 01.6	93 44 41.0	2,613
T. 60 N., R. 25 W., corner of secs. 29, 30, 31, and 32; crossroads	39 58 27.7	93 44 40.9	2,637
Chicago, Rock Island & Pacific Ry	39 58 59.4	93 44 41.3	3,213
T. 60 N., R. 25 W., corner of secs. 19, 20, 29, and 30; crossroads	39 59 19.9	93 44 41.4	2,073

CHILLICOTHE QUADRANGLE—Continued.

Along highways east-west through center of quadrangle.

Station.	Latitude.	Londitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Tps. 58 and 59 N., R. 25 W., 300 feet east of corner of secs. 4, 5, 32, and 33, 80 feet northeast of northeast corner of Central M. E. Chapel, 20 feet south of center of road at end of north-south fence; iron post stamped "Prim. Trav. Sta. No. 24 Mo., 1913"	39 52 23.6	93 43 22.1	.....
T road south	39 52 12.3	93 42 35.2	3,838
T road north	39 52 15.5	93 41 44.9	3,935
T. 58 N., R. 25 W., apparent north corner between secs. 2 and 3. (The south corner of secs. 34 and 35, T. 59 N., R. 25 W., as indicated by road north, is 30 feet east of preceding position)	39 52 26.6	93 41 11.1	2,864
T road south	39 52 38.9	93 40 19.7	4,198
T. 59 N., R. 25 W., line through center of sec. 36; T road west	39 52 41.6	93 39 29.0	3,969
T road south (420 feet south of preceding position is corner of Tps. 58 and 59 N., Rs. 24 and 25 W.)	39 52 34.0	93 38 54.8	2,773
T. 59 N., R. 24 W., apparent quarter corner on south side of sec. 32; T road north	39 52 32.6	93 37 34.0	6,300
T road north, 300 feet east of church	39 52 34.0	93 36 36.8	4,469
T. 58 N., R. 24 W., north quarter corner of sec. 4; T road south	39 52 34.4	93 36 23.2	1,065
T. 59 N., R. 24 W., south corner of secs. 33 and 34; T road north	39 52 35.2	93 35 52.6	2,385
T. 58 N., R. 24 W., north corner of secs. 3 and 4, 20 feet south by 20 feet east of T road corners, 1.5 feet from corner fence post; iron post stamped "Prim. Trav. Sta. No. 25 Mo., 1913"	39 52 35.0	93 35 48.5	319
T. 59 N., R. 24 W., south corner of secs. 34 and 35; fence north (260 feet east of preceding position is north corner of secs. 2 and 3, T. 58 N., R. 24 W.)	39 52 37.1	93 34 44.8	4,979
T. 59 N., R. 24 W., south corner of secs. 35 and 36; T road north (110 feet west of preceding position is north corner of secs. 1 and 2, T. 58 N., R. 24 W.; T road south)	39 52 38.2	93 33 36.1	5,360
T. 59 N., R 24 W., south quarter corner of sec. 36; T road north	39 52 38.5	93 33 01.9	2,665
Tps. 58 and 59 N., Rs. 23 and 24 W.; crossroads	39 52 38.9	93 32 28.2	2,630
T road north	39 52 39.8	93 31 47.8	3,155
Sturges, crossroads at, south corner of secs. 32 and 33, T. 59 N., R. 23 W.	39 52 41.5	93 30 04.9	8,030

Magnetic declination for east border of quadrangle, 7° 09′ E.; for south border, 7° 53′ E.; for east–west line through middle, 7° 16′ E.; for west border, 7° 47′ E.

CHULA QUADRANGLE.

Along highways near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Prim. Trav. Sta. No. 12, 1913	39 59 41.18	93 29 00.25	.....
T. 60 N., R. 23 W., quarter corner between secs. 22 and 27; T road south	39 59 41.9	93 28 26.3	2,645
T. 60 N., R. 23 W., quarter corner between secs. 27 and 34; crossroads	39 58 49.5	93 28 25.7	5,305
T. 60 N., R. 23 W., south quarter corner of sec. 34, line between Livingston and Grundy counties; T road north	39 57 57.0	93 28 25.3	5,305
T. 59 N., R. 23 W., north corner between secs. 3 and 4	39 57 56.4	93 29 01.3	2,806
T. 59 N., R. 23 W., corner of secs. 3, 4, 9, and 10; crossroads	39 57 05.0	93 29 01.2	5,210
T. 59 N., R. 23 W., corner of secs. 9, 10, 15, and 16; crossroads	39 56 12.5	93 29 00.6	5,310
T. 59 N., R. 23 W., corner of secs. 15, 16, 21, and 22; crossroads	39 55 20.1	93 28 59.8	5,300
T. 59 N., R. 23 W., corner of secs. 21, 22, 27, and 28; T road west (335 feet south is crossing of Chicago, Milwaukee & St. Paul Ry.)	39 54 27.7	93 28 59.1	5,300
T. 59 N., R. 23 W., corner of secs. 27, 28, 33, and 34; crossroads	39 53 35.1	93 28 58.0	5,320
T. 59 N., R. 23 W., south corner of secs. 33 and 34; T road north	39 52 42.6	93 28 56.9	5,319
T. 58 N., R. 23 W., north corner of secs. 3 and 4, 25 feet east by 25 feet south of, 3 feet east of corner fence post at T road corners, 1 mile east of Sturges; iron post stamped "Prim. Trav. Sta. No. 18 Mo., 1913"	39 52 42.2	93 29 00.9	314
T. 58 N., R. 23 W., corner of secs. 3, 4, 9, and 10; T road corners	39 51 51.0	93 29 00.5	5,187
T. 58 N., R. 23 W., quarter corner between secs. 15 and 16; T road east	39 50 32.2	93 28 59.2	7,971
T. 58 N., R. 23 W., corner of secs. 15, 16, 21, and 22; T road west, about 940 feet south is T road east	39 50 06.0	93 28 58.8	2,650
T. 58 N., R. 23 W., corner of secs. 21, 22, 27, and 28; crossroads	39 49 13.5	93 28 58.1	5,310
T. 58 N., R. 23 W., corner of secs. 27, 28, 33, and 34; crossroads	39 48 21.0	93 28 57.3	5,315
T. 58 N., R. 23 W., quarter corner between secs. 33 and 34	39 47 54.5	93 28 56.9	2,675

CHULA QUADRANGLE—Continued.

Along highways near west border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Tps. 57 and 58 N., R. 23 W., corner of secs. 3, 4, 33, and 34; T road east (1,535 feet south of this position is crossing of Chicago, Burlington & Quincy R. R.)	39 47 28.0	93 28 56.7	2,615
T. 57 N., R. 23 W., corner of secs. 3, 4, 9, and 10; crossroads	39 46 35.9	93 28 55.8	5,270
T. 57 N., R. 23 W., quarter corner between secs. 9 and 10; crossroads	39 46 08.9	93 28 55.6	2,733
T. 57 N., R. 23 W., corner of secs. 9, 10, 15, and 16 (20 feet south is T road west and 20 feet north is a T road east)	39 45 41.8	93 28 55.3	2,745

Magnetic declination for west border of quadrangle, 7° 09′ E.

Along highways in northwest corner of quadrangle.

T. 60 N., R. 23 W., corner of secs. 21, 22, 27, and 28, 16 feet south of center of east-west road, opposite road north and 4 feet from wire fence line and fence running north; iron post stamped "Prim. Trav. Sta. No. 12, Mo., 1913"	39 59 41.18	93 29 00.25	.....

Magnetic declination, 7° 13′ E.

DAWN QUADRANGLE.

Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 57 N., R. 23 W., quarter corner between secs. 17 and 20; crossroads	39 44 47.0	93 30 36.6	.....
T. 57 N., R. 23 W., corner of secs. 17, 18, 19, and 20	39 44 45.6	93 31 11.2	2,704
T road east	39 44 45.4	93 31 58.3	3,680
Three-span bridge over Grand River; center of middle span	39 44 29.9	93 32 04.5	1 644
T. 57 N., R. 24 W., corner of secs. 23, 24, 25, and 26; T road east	39 43 51.2	93 33 20.4	7,103
Iron span bridge over creek; center	39 43 59.5	93 33 20.5	840
Chicago, Milwaukee & St. Paul Ry. crossing	39 44 51.6	93 33 21.8	5,269
Trestle No. 708 (Chicago, Milwaukee & St. Paul Ry.), south end of; center of track	39 43 54.6	93 34 46.9	8,803
T 57 N., R. 24 W., quarter corner between secs. 21 and 22	39 44 14.6	93 35 41.4	4,710
T. 57 N., R. 24 W., quarter corner between secs. 20 and 21; stone	39 44 14.1	93 36 48.6	5,250
T. 57 N., R. 24 W., center of sec. 20; crossroads (1,305 feet west of preceding position is T road east)	39 44 13.6	93 37 22.7	2,666
Utica station, 115 feet N. 67° 50′ E. (true) from road crossing, 2.5 feet north of corner of right of way fence, 40 feet north of center of road; iron post stamped "Prim. Trav. Sta. No. 20 Mo., 1913"	39 44 27.9	93 38 05.5	3,645
T. 57 N., Rs. 24 and 25 W., apparent corner of secs. 13, 18, 19, and 24, or east corner of secs. 13 and 14; a fence runs west and at a point 213 feet north a fence runs east, which may be the corner of secs. 18 and 19 if there is a jog in section line (could not be ascertained)	39 44 37.0	93 38 53.5	3,864
T road north	39 44 21.3	93 39 59.7	5,411
T. 57 N., R. 25 W., corner of secs. 14, 15, 22, and 23; T road west	39 44 33.3	93 41 06.7	5,373
T. 57 N., R. 25 W., quarter corner between secs. 15 and 22	39 44 33.8	93 41 40.7	2,655
Crossroads	39 44 34.0	93 42 31.6	3,975
T. 57 N., R. 25 W., corner of secs. 16, 17, 20, and 21; T road south	39 44 34.1	93 43 21.2	3,880
T. 57 N., R. 25 W., corner of secs. 17, 18, 19, and 20, 25 feet south by 20 feet west of, 1.5 feet from corner fence post; iron post stamped "Prim. Trav. Sta. No. 21 Mo., 1913"	39 44 34.4	93 44 29.5	5,334

Magnetic declination for north border of quadrangle, 7° 53′ E.

GALLATIN QUADRANGLE.

Along highways near north border and in northwest corner of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Gallatin, 2 miles west of, in sec. 13, T. 59 N., R. 28 W.; T road north.	39 55 26.69	93 59 28.03	.....
T. 59 N., R. 28 W., line between secs. 1 and 12; crossroads	39 56 45.13	93 59 29.66	7,940
T. 59 N., Rs. 27 and 28 W., quarter corner between secs. 1 and 6	39 57 11.79	93 59 12.99	2,995
Tps. 59 and 60 N., Rs. 27 and 28 W., township corner, 30 feet west of road marked by a stone	39 57 37.86	93 59 13.71	2,638
T. 60 N., R. 28 W., stone at quarter corner between secs. 30 and 31	39 58 30.44	93 58 32.42	6,217
T. 60 N., R. 28 W., near middle of sec. 30, 15 feet east of north-south road and 35 feet south of center of road, 2 feet from wire fence; iron post stamped "Prim. Trav. Sta. No. 8, 1913"	39 59 02.74	93 58 33.41	3,270
T road north	39 58 57.36	93 57 25.38	5,324
Public road crossing Wabash R. R	39 58 44.18	93 57 06.70	1,973
T. 60 N., R. 27 W., north part of sec. 33; T road west	39 58 23.03	93 56 16.49	4,457
T. 60 N., R. 27 W., quarter corner between secs. 27 and 34	39 58 32.89	93 55 08.58	5,381
Crossroads	39 58 33.38	93 54 17.33	3,991
T. 60 N., R. 27 W., corner of secs. 25, 26, 35, and 36; crossroads	39 58 33.80	93 53 26.27	3,976
T. 60 N., R. 26 W., 15 feet west by 5 feet north of west corner between secs. 30 and 31, in line with road east, 1.5 feet from wire fence, 50 feet south of iron bridge; iron post	39 58 33.63	93 52 18.24	5,296
T. 60 N., R. 26 W., corner of secs. 29, 30, 31, and 32; T road south	39 58 33.82	93 51 22.90	4,308
T. 60 N., R. 26 W., corner of secs. 28, 29, 32, and 33; T road north	39 58 33.01	93 50 14.44	5,332
T. 60 N., R. 26 W., quarter corner between secs. 28 and 33; T road west	39 58 32.21	93 49 40.41	2,651
Jamesport, 100 feet west of station, at street crossing; semaphore post; center of main track	39 58 26.46	93 48 03.50	7,568
T. 60 N., R. 26 W., quarter corner between secs. 25 and 26	39 58 54.62	93 46 51.36	6,299
T. 60 N., R. 26 W., corner of secs. 23, 24, 25, and 26; T road east	39 59 20.61	93 46 51.40	2,630
Line between Grundy and Davies counties; center of road	39 59 46.28	93 45 44.65	5,809

Magnetic declination for north border of quadrangle, 7° 51′ E.

Along highways near south border of quadrangle.

T. 57 N., R. 26 W., stone at corner of secs. 10, 11, 14, and 15	39 45 24.9	93 47 47.2	.....
T. 57 N., R. 26 W., stone at quarter corner between secs. 10 and 15	39 45 25.5	93 48 21.1	2,646
T. 57 N., R. 26 W., corner of secs. 9, 10, 15, and 16; crossroads	39 45 26.2	93 48 54.7	2,630
T. 57 N., R. 26 W., corner of secs. 8, 9, 16, and 17; crossroads	39 45 27.3	93 50 02.2	5,276
T. 57 N., R. 26 W., quarter corner between secs. 8 and 17	39 45 27.7	93 50 35.5	2,600
T. 57 N., R. 26 W., corner of secs. 7, 8, 17, and 18; crossroads	39 45 27.8	93 51 09.0	2,610
T. 57 N., R. 26 W., west corner of secs. 7, 18, T road east	39 45 27.8	93 52 13.7	5,055
T. 57 N., R. 26 W., T road corners, apparent east corner of secs. 12 and 13, 22 feet north by 22 feet west of; 1 foot south of corner fence post; iron post stamped "Prim. Trav. Sta. No. 22 Mo., 1913"	39 45 29.2	93 52 14.0	140
T. 57 N., R. 27 W., corner of secs. 11, 12, 13, and 14; crossroads	39 45 28.4	93 53 20.6	5,205
T. 57 N., R. 27 W., quarter corner between secs. 11 and 14	39 45 28.5	93 53 55.0	2,685
T. 58 N., R. 28 W., approximate east corner of secs. 1 and 2. (The east corner of secs. 6 and 7, R. 27 W., is about 85 feet north of this position.)	39 51 31.2	93 59 06.8	.....
T. 58 N., R. 27 W., corner of secs. 5, 6, 7, and 8; crossroads	39 51 33.0	93 57 56.5	5,492
T. 58 N., R. 27 W., quarter corner between secs. 5 and 8; T road south. (580 feet east of preceding position is T road north)	39 51 33.3	93 57 21.8	2,701
T. 58 N., R. 27 W., corner of secs. 4, 5, 8, and 9; T road north	39 51 33.4	93 56 47.7	2,664
T road west	39 51 33.9	93 55 57.7	3,900
T. 58 N., R. 27 W., center of sec. 3; lane north	39 51 59.7	93 55 04.4	4,083
T. 58 N., R. 27 W., quarter corner between secs. 2 and 3 (apparent); T road west	39 51 59.8	93 54 30.4	2,655
Grand River, ford	39 52 21.2	93 53 44.2	4,198
Carlow, west of, 55 feet S. 47° 50′ W. (true) from center of track at road crossing, 1 foot east of right of way corner fence post, west of Magill flag station signpost; iron post stamped "Prim. Trav. Sta. No. 23 Mo., 1913"	39 52 43.2	93 53 42.3	2,235
Road crossing	39 52 39.8	93 52 49.2	4,154
Road crossing	39 52 36.4	93 51 50.7	4,575
Carlow station, road crossing at Wabash R. R	39 52 30.5	93 50 08.5	7,990
Carlow Station, crossroads at, near church and store	39 53 02.1	93 50 08.9	3,200
T. 59 N., R. 26 W., stone in center of sec. 33	39 52 49.6	93 49 34.8	2,950
T. 59 N., R. 26 W., quarter corner between secs. 33 and 34; crossroads	39 52 49.1	93 49 00.9	2,640
Crossroads	39 52 48.4	93 48 10.3	3,950
T. 59 N., R. 26 W., quarter corner between secs. 34 and 35; fence south	39 52 48.4	93 47 53.1	1,338
T. 59 N., R. 26 W., quarter corner between secs. 35 and 36; T road west	39 52 47.8	93 46 44.8	5,325
Tps. 58 and 59 N., Rs. 25 and 26 W., stone at corner, line between Livingston and Daviess counties	39 52 20.8	93 45 36.3	6,004

Magnetic declination for south border of quadrangle, 8° 25′ E.; east border, 7° 47′ E.; east-west line through center 8° 00′ E.

GALT QUADRANGLE.

Along highways near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 60 N., R. 23 W., corner of secs. 15, 16, 21, and 22; right angle in road	40 00 33.8	93 29 00.5	.....
T road corners, roads north, south, and west	40 01 13.5	93 28 43.9	4,223
T. 61 N., R. 23 W., south corner of secs. 33 and 34; T road north	40 01 57.2	93 28 48.6	4,436
T. 61 N., R. 23 W., corner of secs. 27, 28, 33, and 34; T road west	40 02 49.8	93 28 48.8	5,320
T road, roads north, south, and west	40 03 55.4	93 28 32.2	6,767
T. 61 N., R. 23 W., quarter corner between secs. 15 and 16	40 05 01.4	93 28 49.0	6,799
T. 61 N., R. 23 W., corner of secs. 3, 4, 9, and 10; T road north	40 06 20.1	93 28 49.0	7,963
Dunlap, 475 feet east of station, 22 feet north of center of Quincy, Omaha & Kansas City R. R. track, 15 feet east of center of public road, 5 feet from crossing signpost; iron post stamped "Prim. Trav. Sta. No. 13 Mo., 1913"	40 06 35.6	93 28 49.0	1,570
T. 61 N., R. 23 W., north corner of secs. 3 and 4; T road south	40 07 11.2	93 28 49.3	3,606
T. 62 N., R. 23 W., 0.25 mile west of corner of secs. 26, 27, 34, and 35; T road north	40 08 03.9	93 27 58.3	6,644
T. 62 N., R. 23 W., quarter corner between secs. 22 and 23	40 09 22.6	93 27 41.0	8,072
T. 62 N., R. 23 W., line between secs. 21 and 22; T road north	40 09 35.6	93 28 49.4	5,476
T. 62 N., R. 23 W., quarter corner between secs. 15 and 16; T road east	40 10 15.2	93 28 49.3	4,000
T. 62 N., R. 23 W., corner of secs. 9, 10, 15, and 16; T road west	40 10 41.4	93 28 49.3	2,660
T. 62 N., R. 23 W., corner of secs. 3, 4, 9, and 10	40 11 34.0	93 28 49.1	5,320
T. 63 N., R. 23 W., south corner of secs. 33 and 34; crossroads. (The north corner of secs. 3 and 4, T. 62 N., R. 23 W., is about 75 feet east of this position, but there is nothing to indicate the line)	40 12 25.4	93 28 49.8	5,200
T. 63 N., R. 23 W., corner of secs. 27, 28, 33, and 34	40 13 18.2	93 28 49.3	5,346
T. 63 N., R. 23 W., near center of sec. 22, on east side of road, 900 feet south of crossroads, opposite house of James Batson; iron post stamped "Prim. Trav. Sta. No. 14 Mo., 1913"	40 14 28.2	93 28 14.8	7,568
T. 63 N., R. 23 W., quarter corner between secs. 22 and 23; T road west	40 14 37.1	93 27 41.2	2,761

Magnetic declination for west border of quadrangle, 7° 41′ E.

GOWER QUADRANGLE.

Along highways near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 55 N., R. 32 W., corner of secs. 20, 21, 28, and 29; T road east, west and north roads	39 33 30.0	94 30 33.0	.....
T. 55 N., R. 32 W., corner of secs. 16, 17, 20, and 21	39 34 22.3	94 30 31.9	5,291
Atchison, Topeka & Santa Fe Ry. crossing	39 34 54.8	94 30 31.4	3,286
T. 55 N., R. 32 W., 0.25 mile north of corner of secs. 8, 9, 10, and 17; T road corner, east, west, and south roads	39 35 28.2	94 30 30.7	3,381
T. 55 N., R. 32 W., 27 feet west of corner of secs. 28, 29, 32, and 33, in ground at T road west, 15 feet east of fence corner; iron post	39 37 52.0	94 30 28.8	.....
T. 56 N., R. 32 W., quarter corner between secs. 28 and 29, T roads east, west, and south	39 38 18.0	94 30 28.6	2,627
Tps. 56 and 57 N., R. 32 W., corner of secs. 4, 5, 32, and 33; T road corner, roads east, west, and north	39 42 13.6	94 30 26.3	.....
T. 57 N., R. 32 W., corner of secs. 28, 29, 32, and 33; T road corners, roads east, west, and south	39 43 06.6	94 30 27.5	5,372
T road east	39 43 31.8	94 30 10.9	2,860
Stewartsville, 0.25 mile west of, 45 feet south of center of Chicago, Burlington & Quincy R. R., 65 feet southwest of public road crossing, 18 inches from corner post in wire fence; iron post stamped "Prim. Trav. Sta. No. 2, Mo., 1913"	39 44 59.8	94 30 04.0	8,920

Magnetic declination for east border of quadrangle, 8° 35′ E.

GREEN CITY QUADRANGLE.

Along highways in southwest corner of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Small truss bridge over creek	40 15 07.09	92 59 58.87	.....

Magnetic declination for southwest corner of quadrangle, 7° 47′ E.

HALE QUADRANGLE.

Along highways near northwest corner of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 57 N., R. 23 W., 25 feet west by 15 feet south of corner of secs. 15, 16, 21, and 22, 2 feet from fence corner at crossroads; iron post stamped "Prim. Trav. Sta. No. 19, Mo., 1913"	39 44 47.9	93 28 54.6	.....
T road south	39 44 48.4	93 29 45.0	3,932

Magnetic declination for northwest corner of quadrangle, 8° 00′ E.

LUCERNE QUADRANGLE.

Along highways near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 62 N., R. 23 W., corner secs. 14, 15, 22, and 23; T road east	40 15 03.48	93 27 41.15	.....
T. 63 N., R. 23 W., quarter corner between secs. 14 and 23	40 15 03.93	93 27 07.12	2,640
T. 63 N., Rs. 22 and 23 W., corner of secs. 18, 19, 23, and 24; crossroads	40 15 04.25	93 25 24.15	7,984
T. 63 N., Rs. 22 and 23 W., quarter corner between secs. 13 and 18	40 15 30.44	93 25 24.28	2,650
T. 63 N., R. 22 W., quarter corner between secs. 17 and 18	40 15 30.71	93 24 18.57	5,095
T. 63 N., R. 22 W., quarter corner between secs. 16 and 17	40 15 31.93	93 23 10.67	5,267
Iron bridge, center of	40 15 45.68	93 22 38.86	2,831
County line, approximately, between Grundy and Sullivan counties; no fence line	40 15 46.07	93 22 01.67	2,884
T. 63 N., R. 22 W., in northwest quarter of sec. 15; T road corners, roads north, south, and west, about 0.25 mile east of county line	40 15 46.36	93 21 44.52	1,331
T. 63 N., R. 22 W., in southwest quarter of sec. 10, T road east, 15 feet west of center of road, in line with road; iron post stamped "Prim. Trav. Sta. No. 15 Mo., 1913"	40 16 12.85	93 21′44.86	2,682
Chicago, Milwaukee & St. Paul Ry. crossing; T road south on line between secs. 10 and 11 is 1,335 feet west of this position	40 16 14.14	93 20 36.21	5,325
T. 63 N., R. 22 W., corner of secs. 11, 12, 13, and 14	40 16 01.70	93 19 45.08	4,160
T. 63 N., R. 22 W., quarter corner between secs. 12 and 13; crossroads	40 16 02.14	93 19 10.90	2,651
T. 63 N., Rs. 21 and 22 W., corner of secs. 7, 18, 12, and 13	40 16 02.58	93 18 36.52	2,666
Crossroads	40 16 03.60	93 18 20.07	1,278
T. 63 N., R. 21 W., corner of secs. 7, 8, 17, and 18; T road south	40 16 03.58	93 17 29.37	3,930
T. 63 N., R. 21 W., corner of secs. 17, 18, 19, and 20; crossroads	40 15 11.20	93 17 29.20	5,300
T. 63 N., R. 21 W., corner of secs. 16, 17, 20, and 21; crossroads	40 15 12.67	93 16 20.79	5,308

Magnetic declination for south border of quadrangle, 7° 34′ E.

MAYSVILLE QUADRANGLE.

Along highways in southwest corner of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Stewartsville, 200 feet east of station; street crossing	39 45 02.0	94 29 46.6	.....

Magnetic declination for south border of quadrangle, 8° 24′ E.

MILAN QUADRANGLE.

Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 63 N., R. 21 W., quarter corner between secs. 23 and 24; T road north	40 14 49.6	93 12 55.7	.....
T. 63 N., R. 20 W., apparent west corner of secs. 19 and 30, right angle in road, fence north-south	40 14 24.9	93 11 46.9	5,890
T road north	40 14 25.0	93 11 36.0	850
T. 63 N., R. 19 W., quarter corner between secs. 20 and 21; T road east	40 14 52.3	93 02 42.7	.....
T. 63 N., R. 19 W., quarter corner between secs. 21 and 22; T road north	40 14 51.4	93 01 34.3	5,307
T. 63 N., R. 19 W., center of sec. 22; T road south	40 14 50.9	93 01 00.4	2,630

Magnetic declination for north border of quadrangle, 7° 38′ E.

PLATTSBURG QUADRANGLE.

Along highways near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Primary traverse station No. 5, 1911	39 30 10.4	94 29 27.3	.....
T. 54 N., R. 32 W., apparent corner secs. 3, 4, 9, and 10, intersection of fences in field	39 30 49.3	94 29 26.8	3,941
T road corner, roads east, west, and south	39 31 58.0	94 29 25.9	6,954
T. 55 N., R. 32 W., corner of secs. 27, 28, 33, and 34; crossroads	39 32 37.5	94 29 26.0	3,996
T. 55 N., R. 32 W., corner of secs. 21, 22, 27, and 28	39 33 30.0	94 29 25.8	5,315
T. 55 N., R. 32 W., northeast quarter of sec. 9; T road corners, roads east, west, and north	39 35 54.2	94 29 39.0	.....
T road corners, roads east, west, and south	39 36 59.8	94 29 57.2	6,789
T road corners, roads northwest and southeast	39 38 19.0	94 29 20.9	.....
T. 56 N., R. 32 W., apparent corner secs. 21, 22, 27, and 28; T roads north, south, and east	39 38 44.0	94 29 21.0	2,524
T. 56 N., R. 32 W., stone at quarter corner between secs. 21 and 22; crossroads	39 39 10.1	94 29 21.0	2,643
T. 56 N., R. 32 W., corner secs. 15, 16, 21, and 22; crossroads	39 39 36.3	94 29 20.9	2,650
T. 56 N., R. 32 W., corner secs. 9, 10, 15, and 16	39 40 28.8	94 29 21.0	5,311
T. 56 N., R. 32 W., quarter corner between secs. 9 and 10	30 40 54.8	94 29 21.0	2,640
T. 56 N., R. 32 W., corner secs. 3, 4, 9, and 10; T road corners, roads north, south, and east, and lane west	39 41 21.0	94 29 20.9	2,649
T road corners, roads east, west, and south	39 42 00.4	94 29 29.6	4,039

PLATTSBURG QUADRANGLE—Continued.

Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T road corner, roads east, west, and north	39 44 52.9	94 28 30.0	.....
T. 57 N., R. 32 W., corner of secs. 13, 14, 23, and 24, east-west road, county line between Clinton and Dekalb counties	39 44 52.9	94 27 05.2	6,625
Township line between Rs. 31 and 32 W., intersection of roads, jog of 35 feet, road east is 15 feet south, and road west is 20 feet north	39 44 52.0	94 25 56.8	5,344
T. 57 N., R. 31 W., corner of secs. 16, 17, 20, and 21; T road corner, roads east, west, and north	39 44 51.1	94 23 36.8	10,935
T. 57 N., R. 31 W., corner of secs. 15, 16, 21, and 22; T road south	39 44 51.68	94 22 28.95	5,300
Osborn, 1,000 feet west of station, 60 feet south by 25 feet east to center of Burlington Ry. track at public road crossing, 2 feet west by 5 feet south of wire fence; iron post stamped "Prim. Trav. Sta. No. 3, Mo., 1913"	39 44 52.8	94 21 38.7	3,927
T. 57 N., R. 31 W., corner of secs. 14, 15, 22, and 23	39 44 50.9	94 21 23.5	1,205
T. 57 N., R. 31 W., stone at quarter corner between secs. 14 and 23, 465 feet north is T road west	39 44 51.1	94 20 49.6	2,648
T. 57 N., R. 31 W., stone at corner of secs. 13, 14, 23, and 24; T road, roads east, west, and north	39 44 50.7	94 20 26.0	2,624
T. 57 N., R. 30 W., west corner between secs. 18 and 19; township line	39 44 52.1	94 19 07.9	5,323
T. 57 N., R. 30 W., corner of secs. 17, 18, 19, and 20; T road south	39 44 51.2	94 18 00.5	5,262
T. 57 N., R. 30 W., stone at corner of secs. 16, 17, 20, and 21; T roads north, south, and west	39 44 49.9	94 16 52.7	5,296
T. 57 N., R. 30 W., line between secs. 15 and 16; T road north	39 44 35.2	94 15 44.8	5,511

Magnetic declination for north border of quadrangle 8° 24′ E.; west border, 8° 35′ E.

POLO QUADRANGLE.

Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Cameron, opposite northwest corner of public park, 252 feet east of center of Chicago, Rock Island & Pacific Ry. track, 3.4 feet south of sidewalk, 17.5 feet east of bell signal post at crossing, top of post 3 inches below level of sidewalk; iron post stamped "Prim. Trav. Sta. No. 4, M[illegible], 1913"	39 44 34.0	94 14 22.4	.....
T roads east, west, and south	39 44 33.6	94 13 37.6	3,500
T. 57 N., R. 29 W., west corner of secs. 18 and 19; approximate corner of Clinton, Dekalb, and Caldwell counties	39 44 44.7	94 12 20.8	6,101
T road south	39 44 41.2	94 10 04.0	5,185
T. 57 N., R. 29 W., corner of secs. 17, 18, 19, and 20; crossroads	39 44 43.8	94 11 10.3	5,511
T. 57 N., R. 29 W., corner of secs. 16, 17, 20, and 21, T road corner, roads east, west, and north	39 44 39.47	94 09 12.06	4,057
T. 57 N., R. 29 W., corner of secs. 15, 16, 21, and 22	39 44 38.8	94 08 54.7	1,359
T. 57 N., R. 29 W., corner of secs. 14, 15, 22, and 23	39 44 35.8	94 07 46.8	5,309
T. 57 N., R. 29 W., corner of secs. 13, 14, 23, and 24, 28 feet south by 24 feet west of center of crossroads; iron post stamped "Prim. Trav. Sta. No. 5, Mo., 1913"	39 44 33.8	94 06 42.0	5,070
T. 57 N., R. 29 W., east corner of secs. 13 and 24 (the west corner of secs. 18 and 19, T. 57 N., R. 29 W. is 100 feet south of this position)	39 44 34.0	94 05 35.0	5,235
T. 57 N., R. 28 E., corner of secs. 17, 18, 19, and 20; crossroads	39 44 33.1	94 04 36.7	4,554
T. 57 N., R. 28 E., corner of secs. 16, 17, 20, and 21; center of road, cross fence	39 44 33.0	94 03 29.4	5,255
T. 57 N., R. 28 W., quarter corner between secs. 16 and 21	39 44 32.7	94 02 56.6	2,560
T. 57 N., R. 28 W., corner of secs. 14, 15, 22, and 23; hedge row on north-south line	39 44 32.4	94 01 16.7	7,806
Hamilton, west part of, 2 feet south by 1 foot west of northwest corner of brick school building on West Mill Street; iron post stamped "Prim. Trav. Sta. No. 6, Mo., 1913" (the approximate corner of secs. 13, 14, 23, and 24, T. 57 N., R. 28 W. is 178 feet west of above permanent station mark)	39 44 32.6	94 00 08.2	5,356

Magnetic declination for north border of quadrangle, 8° 46′ E.

WINIGAN QUADRANGLE.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Yellow Creek Baptist Church, 1,100 feet west of, in southeast corner of sec. 23, T. 63 N., R. 19 W., inside wire fence corner in northwest corner of crossroads, 30 feet northwest of intersection of roads; iron post stamped "Prim. Trav. Sta. No. 9, 1910, Mo." (tie point, 1913 work)	40 14 23.6	92 59 18.5	.....
T. 63 N., R. 19 W., corner of secs. 23, 24, 25, and 26	40 14 23.3	92 59 18.2	30

WINSTON QUADRANGLE.

Along highways near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 57 N., R. 28 W., approximate corner secs. 11, 12, 13, and 14	39 45 24.99	94 00 10.30	.....
T. 57 N., R. 28 W., corner of secs. 1, 2, 11, and 12; T road east (T road west is 90 feet south of this position)	39 46 17.21	94 00 10.63	5,285
T. 57 N., R. 28 W., approximate north corner of secs. 1 and 2 (the south corner of secs. 35 and 36, T. 58 N., R. 28 W., is about 85 feet east of this position)	39 47 02.42	94 00 11.08	4,576
T. 58 N., R. 28 W., corner of secs. 25, 26, 35, and 36; crossroads	39 48 02.29	94 00 10.84	6,058
T. 58 N., R. 28 W., corner of secs. 23, 24, 25, and 26; crossroads	39 48 54.57	94 00 11.70	5,291
T. 58 N., R. 28 W., corner of secs. 13, 14, 23, and 24; crossroads	39 49 46.84	94 00 12.87	5,291
T road east (on section line ?), near end of iron bridge	39 50 39.12	94 00 12.74	5,291
T. 58 N., R. 28 W., corner of secs. 1, 2, 11, and 12, 20 feet south of crossroads, 2 feet east of corner fence post; iron post stamped "Prim. Trav. Sta. No. 7, Mo., 1913"	39 51 31.14	94 00 14.93	5,267
T road south, on north-south section line	39 52 10.48	94 00 15.87	3,983
Tps. 58 and 59 N., line between, about 0.25 mile west of southeast corner of sec. 36	39 52 22.66	94 00 32.71	1,800
T. 59 N., R. 28 W., in southeast quarter of sec. 26, T road south	39 53 17.65	94 00 33.49	5,565
T. 59 N., R. 28 W., corner of secs. 23, 24, 25, and 26; center of east-west road	39 54 07.35	94 00 17.91	5,174
T. 59 N., R. 28 W., corner of secs. 23, 24, 13, and 14; crossroads	39 54 59.66	94 00 19.00	5,294
T. 59 N., R. 28 W., quarter corner between secs. 13 and 14	39 55 25.85	94 00 19.42	2,651

Magnetic declination for east border of quadrangle, 8° 10′ E.

Joplin district, Neosho, Noel, Ritchey, and Wyandotte quadrangles.

McDONALD AND NEWTON COUNTIES.

The following geographic positions were determined by primary traverse and are based upon positions in Wyandotte quadrangle located in 1908, approximate North American datum. A tie was also made with primary traverse station No. 8, 1909, both described in Bulletin 440.

The work was done by E. L. McNair in April, 1914.

JOPLIN DISTRICT.

Along highways near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Tps. 26 and 27 N., Rs. 30 and 31 W., 45 feet south and 25 feet west of, at crossroads, close to hedge fence, iron bench mark post stamped "Prim. Trav. Sta. No. 3, 1914, Mo."	37 00 33.9	94 15 37.8	.....
Tps. 26 and 27 N., R. 31 W., corner secs. 1, 2, 35, and 36, crossroads at	37 00 35.0	94 16 42.7	5,268
T. 26 N., R. 31 W., north corner between secs. 2 and 3, T road south	37 00 35.6	94 17 48.2	5,310
T. 27 N., R. 31 W., 195 feet east of south corner secs. 33 and 34, is T road south at north corner secs. 3 and 4, T. 26 N., R. 31 W	37 00 36.1	94 18 50.6	5,060
Tps. 26 and 27 N., 0.25 mile north of line between, on line between secs. 34 and 35; stake	37 00 56.5	94 30 57.8	.....
Shoal Creek, north end of bridge over	37 01 15.4	94 30 44.2	2,204
T. 27 N., Rs. 32 and 33 W., quarter corner between secs. 31 and 36, stone	37 01 08.1	94 28 45.3	9,666
Milepost "K. C. 162" center of track of Kansas City Southern Ry. at	37 00 28.1	94 27 55.1	5,738

Magnetic declination for south border of quadrangle, 8° 26′ E.

NEOSHO QUADRANGLE.

Along highways through center of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Racine station, about 1.20 miles east of, public road crossing	36 53 27.2	94 29 57.7	6,209
T. 25 N., R. 32 W., quarter corner between secs. 17 and 18, crossroads at	36 53 18.0	94 27 46.1	10,730
T. 25 N., R. 32 W., quarter corner between secs. 16 and 17, T road west	36 53 17.5	94 26 40.7	5,310
T. 25 N., R. 32 W., corner secs. 16, 17, 20, and 21, crossroads	36 52 51.3	94 26 41.4	2,649
T. 25 N., R. 32 W., corner secs. 15, 16, 21, and 22, crossroads	36 52 50.6	94 25 36.2	5,290
T. 25 N., R. 32 W., corner secs. 14, 15, 22, and 23, crossroads	36 52 49.6	94 24 31.1	5,294
T. 25 N., R. 32 W., corner secs. 13, 14, 23, and 24, crossroads	36 52 48.7	94 23 26.9	5,215
Neosho, T. 25 N., Rs. 31 and 32 W., approximate corner secs. 18, 19, 13, and 24 (this corner is at north end of High Street)	36 52 47.9	94 22 21.9	5,280
Neosho, 0.61 mile north of Kansas City Southern Ry. station, 180 feet east of above-described section corner, 26 feet west of track on wire fence line; iron bench-mark post stamped "Prim. Trav. Sta. No. 1, 1914, Mo."	36 52 47.9	94 22 19.5	195
T. 25 N., R. 31 W., corner secs. 17, 18, 19, and 20, fences east, west, and north	36 52 40.2	94 21 17.2	5,126
T. 25 N., R. 31 W., corner secs. 16, 17, 20, and 21, center of east and west road	36 52 45.8	94 20 08.4	5,615
T. 25 N., R. 31 W., corner secs. 15, 16, 21, and 22, T road west	36 52 44.6	94 19 03.4	5,290
T road north	36 52 30.5	94 18 16.0	4,108
T. 25 N., R. 31 W., on line between secs. 22 and 23, T road south	36 52 30.1	94 17 59.8	1,315
Crossroads	36 52 29.7	94 17 27.6	2,616
T. 25 N., R. 31 W., quarter corner between secs. 14 and 23	36 52 42.7	94 17 27.4	1,315
T. 25 N., R. 31 W., corner secs. 13, 14, and 23 and 24	36 52 42.2	94 16 55.3	2,606
T. 25 N., Rs. 30 and 31 W., 35 feet north and 20 feet east of crossroads at corner of secs. 13, 18, 19, 24, 2 feet from wire fence line; iron bench-mark post stamped "Prim. Trav. Sta. No. 2, 1914"	36 52 42.0	94 15 50.6	5,263
T. 25 N., Rs. 30 and 31 W., corner secs. 7, 12, 13, and 18, T road east, fence line west	36 53 33.9	94 15 49.2	5,250
T. 25 N., Rs. 30 and 31 W., corner secs. 1, 6, 7, and 12, road north and south, fence line east and west	36 54 26.0	94 15 47.7	5,270
Granby station (Missouri Pacific Ry.) street crossing at	36 55 09 9	94 15 22 6	4,886
Tps. 25 and 26 N., Rs. 30 and 31 W., corner of, rock in east and west road	36 55 19 9	94 15 46 5	2,183
T. 26 N., Rs. 30 and 31 W., corner secs. 25, 30, 31, and 36	36 56 12.4	94 15 45.3	5,314
Granby station (Frisco Ry.) about 400 feet east of, public road crossing	36 56 34.3	94 15 57.5	2,420

NEOSHO QUADRANGLE—Continued.

Along highways near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 26 N., Rs. 30 and 31 W., corner secs. 19, 30, 24, and 25	36 57 04.6	94 15 43.2	3,277
T. 26 N., Rs. 30 and 31 W., corner secs. 13, 18, 19, and 24; crossroads	36 57 57.1	94 15 42.0	5,310
T. 26 N., Rs. 30 and 31 W., quarter corner between secs. 13 and 18; T road west	36 58 22.9	94 15 41.4	2,615
T. 26 N., Rs. 30 and 31 W., corner secs. 7, 12, 13, and 18; crossroads	36 58 49.3	94 15 40.6	2,665
T. 26 N., Rs. 30 and 31 W., corner secs. 1, 6, 7, 12; crossroads	36 59 41.9	94 15 39.2	5,320

Along highways near north border of quadrangle.

Diamond Village, T. 26 N., R. 31 W., corner secs. 3, 4, 9, and 10; main crossroads at	36 59 42.6	94 18 52.4	.....
T. 26 N., R. 31 W., corner secs. 4, 5, 8, and 9; crossroads	36 59 43.6	94 19 57.1	5,250
T. 26 N., R. 31 W., corner secs. 5, 6, 7, and 8; road crossing, center of	36 59 44.4	94 21 01.3	5,204
T. 26 N., R. 31 W., 15 feet south and 20 feet west of west corner secs. 6 and 7 and 15 feet north and 20 feet west of east corner secs. 1 and 2, T. 26 N., R. 32 W., inside of fence corner; iron post stamped "Prim. Trav. Sta. No. 4, 1914, Mo."	36 59 46.1	94 22 15.8	6,045
T. 26 N., R. 32 W., corner secs. 1, 2, 11, and 12; crossroads	36 59 46.6	94 23 20.8	5,275
T. 26 N., R. 32 W., corner secs. 2, 3, 10, and 11	36 59 47.2	94 24 25.8	5,275
T. 26 N., R. 32 W., corner secs. 3, 4, 9, and 10; rock at fence line north	36 59 48.2	94 25 31.5	5,324
T. 26 N., R. 32 W., stone, corner secs. 4, 5, 8, and 9; at intersection fence lines north, east, and west	36 59 49.1	94 26 37.2	5,330

Along east border of quadrangle.

T. 25 N., Rs. 30 and 31 W., corner secs. 19, 24, 25, and 30; crossroads at Aroma	36 51 49.5	94 15 52.2	.....
T. 25 N., Rs. 30 and 31 W., quarter corner between secs. 25 and 30; road at fences east and west	36 51 23.4	94 15 53.0	2,640
T. 25 N., Rs. 30 and 31 W., corner secs. 25, 30, 31, and 36; stone near center of road crossing	36 50 57.4	94 15 53.8	2,636
T. 25 N., Rs. 30 and 31 W., quarter corner between secs. 36 and 31, at second-class T road west	36 50 31.1	94 15 54.4	2,655
Tps. 24 and 25 N., Rs. 30 and 31 W., at south corner of secs. 31 and 36; center of east and west road at	36 50 05.2	94 15 55.2	2,626
Sweetwater, T road north at, 25 feet northeast to telephone pole at corner roads; 30 feet northwest to corner of stone	36 49 37.7	94 15 55.8	2,775
T. 24 N., R. 31 W., corner secs. 2, 3, 10, and 11; T road south	36 49 36.0	94 15 07.6	3,920
T. 24 N., R. 31 W., quarter corner between secs. 10 and 11; road at fence line west	36 49 09.9	94 15 08.8	2,640
T. 24 N., R. 31 W., corner secs. 10, 11, 14, and 15; center of north and south road near fence line east	36 48 41.7	94 15 10.0	2,856

Along highways near south border of quadrangle.

T. 24 N., R. 31 W., stone corner secs. 27, 28, 33, and 34, about 250 feet north of ford across Indian Creek	36 46 09.6	94 16 22.2	.....
T. 24 N., R. 31 W., 2,045 feet south of corner secs. 27, 28, 33, and 34, on south side of east and west road and in line with road north; iron bench mark post stamped "Prim. Trav. Sta. No. 5, 1914, Mo."	36 45 49.3	94 16 23.2	2,046
Tps. 23 and 24 N., R. 31 W., on line between secs. 4 and 33; center of road at Newton-McDonald county line crossing	36 45 18.6	94 16 51.7	3,877
Tps. 23 and 24 N., Rs. 32 and 33 W., corner of; also on McDonald-Newton county line	36 45 37.4	94 26 01.0	.....
Forks of road, 0.66 mile west of above township corner	36 45 26.5	94 26 41.6	3,484
T road north; center of east and west road at	36 45 27.1	94 27 05.8	1,970
T. 23 N., R. 33 W., quarter corner between secs. 2 and 3	36 45 16.5	94 28 10.8	5,398
T. 23 N., R. 33 W.; in middle of sec. 3	36 45 12.3	94 28 42.5	2,618

Magnetic declination for north border of quadrangle, 8° 26′ E.; for south border, 8° 32′ E; for east border, 8° 03′ E.; for center, 8° 15′ E.

NOEL QUADRANGLE.

Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T road north	36 44 59.4	94 17 11.1	.....
T road southeast at north side of northeast and southwest road	36 44 49.0	94 17 26.8	1,659
McNatt, west corner of south abutment of iron truss bridge over Indian Creek	36 43 54.8	94 18 42.1	8,217
T. 23 N., Rs. 31 and 32 W., at corner secs. 7, 12, 13, and 18; cross-roads	36 43 40.0	94 19 40.3	4,970
T. 23 N., R. 32 W., stone quarter corner between secs. 11 and 14	36 43 42.6	94 21 18.0	7,957
Erie, 75 feet northwest of August Frost's store, 20 feet north and 35 feet west of T road corners, 12 feet northeast of corner of blacksmith shop; iron post stamped "Prim. Trav. Sta. No. 6, 1914, Mo."	36 43 42.0	94 21 49.2	2,540
T. 23 N., R. 32 W., corner secs. 10, 11, 14, and 15; iron bolt	36 43 43.7	94 21 50.1	187
Goodman station, 100 feet southwest of; public road crossing	36 44 23.1	94 24 28.0	13,460
T. 23 N., R. 32 W., corner secs. 5, 6, 7, and 8; T roads east, west, and north	36 44 43.1	94 24 59.1	3,240
T road corners, roads east, west, and north	36 44 44.8	94 25 47.4	3,940

Magnetic declination along north border of quadrangle, 8° 32′ E.

RITCHEY QUADRANGLE.

Spur line to connect with traverse run in 1909. Along St. Louis & San Francisco R. R. from west border to point 2 miles east of Ritchey.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Granby station, about 1.50 miles east of; public road crossing	36 56 42.7	94 14 22.8	.....
Granby station, 2.20 miles east of; west end of bridge No. 2999 over Shoal Creek (wagon road passes under end of bridge)	36 56 35.6	94 13 36.3	3,844
Shoal Creek, abutment west end of Bridge No. 298.5	36 56 42.4	94 12 09.0	7,116
Ritchey station, 100 feet west of; railroad crossing	36 56 32.8	94 11 08.4	5,017
Ritchey station, 0.81 mile east of; public road crossing	36 56 22.2	94 10 17.4	4,279
T. 26 N., Rs. 29 and 30 W., line between secs. 25 and 30; center of track at	36 56 11.3	94 09 12.4	5,391
Ritchey, about 2.25 miles east of, on south of road crossing St. Louis & San Francisco R. R., 50 feet west and 60 feet north to crossing; iron bench mark post, stamped "Prim. Trav. Sta. No. 8, 1909, Mo."	36 56 08.48	94 08 45.44	2,203
Astronomic value obtained in 1909	36 56 11.70	94 08 46.40	.....

On highway near southwest corner of quadrangle.

T road corners, roads north, east, and west, about 150 feet east of small stream	36 47 38.2	94 14 56.7	.....

Magnetic declination along west border of quadrangle, 8° 03′ E.

WYANDOTTE QUADRANGLE.

Along highways near northeast corner of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 26 N., R. 33 W., 35 feet southeast of corner secs. 4, 5, 8, and 9, beside wire fence; iron post stamped "Prim. Trav. Sta. No. 9, 1906"	36 59 52.34	94 33 05.00	.....
T. 23 N., R. 33 W., corner secs. 5, 6, 7, and 8, 500 feet south of forks of road at large oak tree near east bank of Buffalo Creek, just west of May's store, 25 feet east of a walnut tree, near bank of creek; stone just above surface of ground	36 44 57.1	94 31 25.9	.....
Tps. 23 and 24 N., R. 33 W., corner secs. 5, 6, 31, and 32; stone on county line between Newton and McDonald counties	36 45 49.0	94 31 24.6	5,252
T. 24 N., R. 33 W., corner secs. 29, 30, 31, and 32; road north and west	36 46 41.3	94 31 22.1	5,292
T. 24 N., R. 33 W., 200 yards northwest of southeast corner of sec. 19, 6 feet northwest corner of fence near northwest corner of T road west; iron bench-mark post stamped "Prim. Trav. Sta. No. 7, 1906"	36 47 34.14	94 31 28.2	5,368
Prim. Trav. Sta. No. 8, 1906 (see Bull. 440, p. 489)	36 53 52.14	94 31 36.40	.....
T. 25 N., R. 33 W., quarter corner between secs. 10 and 15, 125 feet east of bridge; center of east and west road at north and south fence	36 53 45.8	94 31 33.5	682
Racine station, center of St. Louis & San Francisco R. R. track at	36 53 40.3	94 31 12.3	1,309

Bandyville, Cabool, Cedar Gap, Clear Springs, Eminence, Exchange, Fordland, Lebanon, Long Lane, Macomb, Monteer, Niangua, Passover, Redford, Ruble, Sinkin, Sleeper, Summersville, and Willow Springs quadrangles.

CAMDEN, HOWELL, LACLEDE, REYNOLDS, SHANNON, TEXAS, WEBSTER, AND WRIGHT COUNTIES.

The following geographic positions on North American datum were determined by primary traverse run in the fall of 1913 by E. L. McNair. The line is based upon a traverse position at Linn Creek, Camden County, established in 1902, described in Bulletin 216, and based upon triangulation of the Coast and Geodetic Survey. The line runs south to the main line of the St. Louis & San Francisco Railroad, which it follows southwest to Marshfield, thence goes south across country to Fordland, on the Springfield-Memphis branch of the Frisco Railroad, thence east along this line and the Current River branch to Low Wossie, Shannon County, thence north and east by road via Ellington and Centerville, Reynolds County, to a tie on primary traverse position about 5 miles north of Centerville, established in 1907, described in Bulletin 440.

This line is about 250 miles in length and the error of closure is $-1.65''$ in latitude and $-1.35''$ in longitude.

In the spring of 1914 lines were run by McNair to complete the control of the Eminence quadrangle.

BANDYVILLE QUADRANGLE.

Along St. Louis & San Francisco R. R. Current River branch, from Birch Tree to Low Wossie.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Birch Tree station, 610 feet west of, 48 feet south of center of track in rear of M. L. Lee's blacksmith and wagon shop, 2 feet from fence corner; iron post stamped "Prim. Trav. Sta. No. 50, 1913, Mo."	36 59 23.0	91 29 42.2	2,217
Road crossing	36 59 36.0	91 29 18.8	2,308
T. 27 N., R. 5 W., quarter corner between secs. 22 and 23, as indicated by fence corner 544 feet north of railroad	36 59 41.7	91 28 29.6	4,027
Road crossing	36 59 25.2	91 26 51.6	2,128
T. 27 N., Rs. 4 and 5 west; center of track at range line	36 59 42.7	91 26 19.0	3,180
T. 27 N., R. 4 W., center of track at line between secs. 19 and 20	36 59 53.5	91 25 19.8	4,925
Bartlett flag station, 350 feet north 25° east from station signpost, 325 feet northeast from store building and post office, 85 feet from center of track and 2½ feet from corner fence post; iron post stamped "Prim. Trav. Sta. No. 51, 1913, Mo."	37 00 12.5	91 24 54.0	2,839
T. 27 N., R. 3 W., quarter corner between secs. 18 and 19; corner about 320 feet south of railroad	37 00 07.3	91 19 10.3	.....
T. 27 N., R. 3 W., corner of secs. 20, 21, 28, and 29	36 59 12.9	91 17 33.9	9,570
Road crossing under railway	36 59 31.1	91 16 13.9	6,741
Low Wossie flag station, 300 feet west of, 190 feet north of track on east side of road leading north, 2 feet from fence line; iron post stamped "Prim. Trav. Sta. No. 52, 1913, Mo."	36 59 18.7	91 15 29.4	3,826
T. 27 N., R. W., corner of secs. 22, 23, 26, and 27; a lane north and south and fence east	36 59 10.3	91 15 23.0	994

Magnetic declination for north border of quadrangle, 6° 10′ E.

CABOOL QUADRANGLE.

Along St. Louis & San Francisco R. R. from Mountain Grove to Sterling flag station.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 28 N., R. 12 W., center of track at line between secs. 8 and 9. This is also county line between Wright and Texas counties	37 07 45.9	92 14 57.0	2,735
T. 28 N., R. 12 W., center of track at line between secs. 10 and 11.	37 07 47.6	92 13 53.1	5,175
Road crossing	37 07 56.2	92 13 20.0	2,821
Road crossing	37 08 17.6	92 12 07.3	6,275
T. 28 N., Rs. 11 and 12 W.; center of track at line between	37 08 23.1	92 11 41.7	2,143
Road crossing	37 08 24.8	92 11 08.6	2,687
T. 28 N., R. 11 W., stone in east and west public road on line between secs. 5 and 6 and which is 820 feet north of railroad track.	37 08 41.0	92 10 37.5	3,002
Road crossing under railroad	37 08 18.3	92 10 01.8	3,695
Hank's spur, switch stand at	37 07 45.4	92 08 41.7	7,292
T. 28 N., R. 11 W., crossing of line between secs. 9 and 10; center of track at	37 07 45.2	92 08 29.3	999
T. 28 N., R. 11 W., crossing of line between secs. 10 and 11; center of track at	37 07 39.5	92 07 25.4	5,212
Road crossing	37 07 20.6	92 06 46.0	3,720
Cabool station, 700 feet west of, 90 feet north of track, 12 feet west of fence corner; iron post stamped "Prim. Trav. Sta. No. 43, 1913, Mo."	37 07 13.7	92 06 14.8	2,627
Road crossing	37 07 25.4	92 05 39.5	3,095
Road crossing	37 07 41.0	92 05 20.9	2,180
Iron girder bridge No. 280.8; east end abutment of	37 08 17.2	92 04 43.2	4,758
T. 28 N., R. 10 W., stone and iron rod at fence corner on section line between secs. 5 and 6, and approximately quarter mile north of corner of secs. 5, 6, 7, and 8. This point is 370 feet west of railroad	37 07 55.2	92 04 14.6	3,213
T. 28 N., R. 10 W., road crossing in line between secs. 5 and 8	37 07 39.0	92 03 52.4	2,428
T. 28 N., R. 10 W., fence corner 75 feet west of railroad, which is on line between secs. 8 and 9, and approximately quarter mile north of corner of secs. 8, 9, 16, and 17	37 07 02.4	92 03 10.3	5,037
Sax's spur, switch stand at	37 06 43.4	92 02 58.4	2,151
T. 28 N., R. 10 W., quarter mile north of line between secs. 16 and 21; center of track at crossing of east and west fence line	37 06 09.6	92 02 31.0	4,082
Sargent flag station, 300 feet south of, 90 feet south 27° west from road crossing, 50 feet south of public road beside corner fence post; iron post stamped "Prim. Trav. Sta. No. 44, 1913, Mo."	37 05 09.0	92 01 36.6	7,548
T. 28 N., R. 10 W., quarter mile north of line between secs. 27 and 34; center of track at east and west fence line	37 04 24.1	92 01 16.7	4,813
T. 27 N., R. 10 W., north corner for secs. 2 and 3. A road east and south. This is county line between Texas and Howell counties.	37 03 18.2	92 01 02.7	6,764
Sterling flag station; road crossing at	37 02 31.8	92 00 26.9	5,513

Magnetic declination for center of quadrangle, 6° 50′ E.; for southeast quarter, 6° 40′ E.

CEDAR GAP QUADRANGLE.

Along St. Louis & San Francisco R. R. from Seymour to Macomb.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 28 N., R. 17 W., quarter corner between secs. 1 and 12. This corner is 610 feet north of railroad	37 08 23.8	92 44 43.6	3,202
Road crossing	37 07 47.7	92 43 11.1	8,332
T. 28 N., R. 16 W., corner of secs. 7, 8, 17, and 18; road north and south, fence line east and west	37 07 31.9	92 43 11.7	1,595
Road crossing, near center of sec. 16	37 07 05.0	92 41 39.9	7,922
NOTE.—County line between Webster and Wright counties could not be located.			
Cedar Gap station, 85 feet east from southeast corner of, 60 feet east of center of track on top of bank, 2 feet from corner post of yard fence; iron post stamped "Prim. Trav. Sta. No. 38, 1913, Mo."	37 06 16.8	92 40 16.1	8,359
T. 28 N., R. 16 W., crossing of line between secs. 22 and 23; center of track	37 06 01.7	92 39 57.3	2,157
Road crossing	37 05 46.3	92 37 53.1	10,185
T. 28 N., Rs. 15 and 16 west, corner of secs. 19, 30, 24, and 25, approximately within 50 feet; 450 feet south of railroad and 35 feet southwest of fence corner	37 05 42.9	92 37 48.1	529
Road crossing under railroad	37 06 15.0	92 36 44.2	6,110
T. 28 N., R. 15 W., corner of secs. 16, 17, 20, and 21; corner is nearly 500 feet north of railroad	37 06 33.1	92 35 36.6	5,773
Mansfield station, 200 feet south 72° west from semaphore post, 80 feet north 43° west from northwest corner of Mansfield hotel, 3 feet from concrete sidewalk and 3 feet from fence corner; iron post stamped "Prim. Trav. Sta. No. 39, 1913, Mo."	37 06 18.7	92 34 58.2	3,437
T. 28 N., R. 15 W., crossing of line between secs. 26 and 27	37 05 25.2	92 33 27.5	9,129
T. 28 N., Rs. 14 and 15 west; crossing of range line	37 05 07.3	92 31 17.9	10,659
Road crossing, private	37 05 21.8	92 30 15.0	5,299

Magnetic declination along east-west line through center of quadrangle, 7° 10′ E.

CLEAR SPRINGS QUADRANGLE.

Along St. Louis & San Francisco R. R. from Sterling flag station to Willow Springs.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Road crossing	37 01 55.9	91 59 52.1	4,603
T. 27 N., R. 10 W.; crossing of line through middle of sec. 13	37 01 05.9	91 59 34.6	5,256
Road crossing	37 00 26.4	91 59 08.5	4,520
T. 27 N., R. 10 W., quarter corner on east side sec. 24; fence north, south, and west	37 00 13.3	91 58 54.2	1,761

EMINENCE QUADRANGLE.

Along St. Louis & San Francisco R. R., Current River branch.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Bartlett flag station, 350 feet N. 25° E. from station sign post, 325 feet northeast from store building and post office, 85 feet from center of track, and 2.5 feet from corner fence post; iron post stamped "Prim. Trav. Sta. No. 51, 1913, Mo."	37 00 12.5	91 24 54.0	.....
T. 27 N., R. 4 W., quarter corner between secs. 17 and 20	37 00 06.8	91 24 46.5	840
Road crossing	37 00 08.5	91 23 54.8	4,201
T. 27 N., R. 4 W.; center of track at line between secs. 16 and 17	37 00 21.0	91 23 07.7	4,022
Eminence turnout; head block at	37 00 36.4	91 22 12.4	4,752
Road crossing	37 00 39.7	91 21 53.5	1,566
T. 27 N., R. 4 W., quarter corner between secs. 13 and 14; corner is in east and west road 550 feet south of railroad	37 00 32.2	91 20 55.9	4,735
T. 27 N., R. 4 W., quarter corner in east side sec. 13	37 00 33.8	91 19 50.8	5,286
Road crossing	37 00 10.6	91 19 10.6	4,018
T. 27 N., R. 3 W.; quarter corner between secs. 18 and 19 corner is 320 feet south of track	37 00 07.3	91 19 10.3	329

Near east border of quadrangle along and near public roads.

T. 27 N., R. 3 W., corner of secs. 14, 15, 22, and 23; at fence corner	37 00 02.6	91 15 21.2	.....
T. 27 N., R. 3 W., quarter corner between secs. 14 and 15	37 00 28.7	91 15 20.4	2,639
T. 27 N., R. 3 W., quarter corner between secs. 2 and 3	37 02 13.6	91 15 17.4	10,610
T. 28 N., R. 3 W., south corner between secs. 34 and 35. The north corner for secs. 2 and 3 is 16 feet east of above	37 02 37.1	91 15 17.3	2,384
T. 28 N., R. 3 W., in northwest quarter of sec. 38, nail in top of small stump 15 inches high and 4 inches in diameter, 10 feet west of road on top of divide just before descending into Rocky Creek	37 03 27.2	91 14 51.3	5,484
T. 28 N., R. 3 W., corner of secs. 22, 23, 26, and 27	37 04 21.8	91 15 14.3	5,828
T road west	37 05 02.8	91 14 57.0	4,373
T lane west	37 06 32.6	91 14 55.1	9,082
T. 28 N., R. 3 W., corner of secs. 2, 3, 10, and 11	37 06 59.2	91 15 10.6	2,965
Shawnee post office, private house and store, 72 feet west, across road and just west of wire fence. In southeast quarter of sec. 3; iron post stamped "Prim. Trav. Sta. No. 53, 1913, Mo."	37 07 15.4	91 15 39.3	2,852
T. 28 N., R. 3 W., north corner for secs. 3 and 4; corner is 900 feet north of road	37 07 51.8	91 16 15.7	4,707
T. 29 N., R. 3 W., corner of secs. 28, 29, 32, and 33	37 08 46.3	91 17 20.6	7,616
T. 29 N., R. 3 W., quarter corner between secs. 20 and 29	37 09 39.4	91 17 51.5	5,923
Sec. 20, northeast quarter of, at junction of road west to Eminence and road east down Jacks Fork; nail in root of water-oak tree, blazed on two sides and marked "U. S. P. T."	37 10 18.6	91 17 59.6	4,018
T. 29 N., R. 3 W., quarter corner between secs. 17 and 20; pile of stones in line with fence west, but 20 feet west of fence south	37 10 31.6	91 17 50.4	1,509
Jacks Fork, center of ford at, not far from quarter corner between secs. 9 and 16, but neither corner or line could be found	37 10 59.4	91 17 18.0	3,851
T. 29 N., R. 3 W., in northwest quarter sec. 15, 100 feet north of bank of Current River at ford, 10 feet south of rod; nail in root of elm tree, blazed on two sides and marked "U. S. P. T."	37 11 09.6	91 15 45.8	7,529
Forks of road, in sec. 14, 33 feet east to signboard "Eminence 8 miles," and 33 feet north to signboard "Centerville 28 miles"	37 10 50.0	91 14 37.7	5,856

Magnetic declination for south border of quadrangle, 6° 10′ E.; for east border, 6° 15′ E.

EMINENCE QUADRANGLE—Continued.

Along highways through center of quarangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 29 N., R. 3 W., sec. 20, northeast quarter of, at junction road west to Eminence and road east down Jacks Fork; nail in root of water-oak tree, blazed on two sides and marked "U. S. P. T."...	37 10 18.56	91 17 59.61	.....
Jacks Fork, at west side of first ford above Shawnee Creek, forks of road.....	37 10 26.9	91 18 31.7	2,731
Forks, roads N. 18° W., S. 28° W., and S. 88° E.....	37 09 58.6	91 19 51.8	7,092
Jacks Fork, on west side at second crossing below Eminence, in root of large elm tree; nail.....	37 09 41.5	91 20 28.4	3,426
Eminence, in northeast corner of courthouse yard, 12 feet south and 6 feet west of corner of stone wall; iron bench mark post stamped "Prim. Trav. Sta. No. 6, 1914, Mo.".....	37 08 53.8	91 21 28.8	6,870
Eminence, T. 29 N., R. 4 W., corner secs. 26, 27, 34, and 35, about 1,500 feet west of Riverside Hotel.....	37 08 49.8	91 21 47.3	1,549
West Eminence station, about 200 feet north of crossing of Salem, Winona & Southern Ry. and road.....	37 08 36.3	91 22 49.7	5,237
T. 29 N., R. 4 W., stone at corner secs. 27, 28, 33, and 34.....	37 08 49.4	91 22 52.6	1,339
Jacks Fork, 200 feet west of railroad trestle over; road crossing....	37 09 10.8	91 22 40.5	2,377
Jacks Fork, on north side of, near switch at loading spur; railroad crossing.....	37 09 31.6	91 23 28.9	4,446
Milepost No. 16; center track opposite.....	37 09 38.1	91 24 02.2	2,771
Railroad crossing, near small frame house on north side of tracks and 70 feet east of trestle (line leaves railroad about 1,000 feet west of this crossing).....	37 09 44.0	91 24 44.8	3,506
T road corner; roads west and north, lane south.....	37 09 38.2	91 25 01.6	1,480
Signboard "Eminence 5 miles"; road forks at.....	37 09 35.2	91 25 29.7	2,293
T. 29 N., Rs. 4 and 5 W., corner secs 25, 36, 30, and 31, in field southeast of road at fence corner, buckeye witness tree.....	37 08 50.5	91 26 07.2	5,445
Forks, road southwest to Birch Tree, road north to Alley and Summersville; road east to Eminence.....	37 08 56.4	91 26 28.4	1,817
Alley, on cupola of concrete-block schoolhouse; flagpole.....	37 09 12.4	91 26 39.6	1,863
West one of three forks at triangle of roads, triangle is about 100 feet on each side; road east to Alley, road west to Summersville, road north to Ink.....	37 09 36.0	91 28 04.1	7,242
T road corners; road to Black Pond up hollow road west to Summersville.....	37 09 37.8	91 28 41.0	2,994
Forks at top of ridge, trail east, in notched root of black-oak tree; nail.....	37 09 02.1	91 29 55.3	7,024

Along highways between east border and north border of quadrangle.

T. 29 N., R. 4 W., about ¼ mile east of quarter corner secs. 12 and 14, 500 feet northeast of a house just southeast of road, in root of oak tree; nail.....	37 10 59.7	91 20 17.9	.....
Top of hill on divide, road at.....	37 11 08.0	91 20 17.1	840
T. 29 N., R. 4 W., crossing of line between secs. 12 and 13, 29 feet west to black oak tree, 14 feet east to white oak; line tree.....	37 11 26.9	91 19 57.3	2,494
T. 29 N., Rs. 3 and 4 W., corner secs. 1, 6, 7, and 12, at north and south fence, about 900 feet west of Edson Greeg's house.....	37 12 19.7	91 19 32.1	5,714
Current River, on east side of, just above Ford, in sec. 6, in notched root of black-oak tree; nail.....	37 13 05.0	91 19 19.8	4,694
T. b. m., just north of wagon track, in notched root of blazed white-oak tree.....	37 13 26.3	91 19 57.2	3,709
Old Stave Mill, near site of, about 170 feet east of ford, 15 feet south of township line, on top of bank, in notched root of rock-maple tree; nail.....	37 14 35.1	91 20 17.7	7,159
Grassy Creek, near mouth of, at junction of roads up Grassy Creek and Current River, 40 feet north of site of old water mill, iron B. M. post stamped "Prim. Trav. Sta. No. 8, 1914, Mo."...	37 14 45.0	91 21 13.4	4,610

Along highways near north border of quadrangle.

Ridge south, about 100 feet west of, and a little north of road turning down ridge to west, in notched root of pine tree; nail.....	37 14 40.2	91 24 12.3	.....
Township line, Government corner on, old stump of witness tree to.	37 14 37.8	91 24 57.2	3,640
White-oak tree with blaze on north and south sides, apparently a "line tree," is just north of top of ridge and 3 feet east of north and south wire fence.....	37 14 54.4	91 25 17.9	2,371
T. 30 N., R. 5 W., south corner secs. 33 and 34; pile of rocks.....	37 14 41.8	91 29 05.2	.....

EMINENCE QUADRANGLE—Continued.

Along highways near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Forks of road, 20 feet south of, 20 feet east of mail box, in notched root of white-oak tree; nail	37 13 32.3	91 28 40.1	7,320
Spur No. 3, crossing of Lumber Co.'s. railway track and road at	37 13 13.4	91 28 38.0	1,918
T. 29 N., R. 5 W., corner secs. 2, 3, 10, and 11; at northeast corner of field	37 12 23.8	91 28 13.1	5,401
Black-oak tree, 150 feet south of foot of hill, on south side of road; nail in notched root of	37 11 19.2	91 28 29.3	6,664
Branson's place, about 1 mile north of, west of wagon track; nail in notched root of white-oak tree	37 10 14.0	91 28 22.0	6,620
Red-oak tree, 3 feet east of wagon track; nail in notched root of	37 06 30.2	91 29 44.3	.....
T. 28 N., R. 5 W., corner secs. 15, 16, 21, and 22; stake in fence corner	37 05 23.6	91 29 27.4	6,871
T. 28 N., R. 5 W., corner secs. 21, 22, 27, and 28, 250 feet north of bottom of ravine, 12 feet east of wire fence; pile of stone	37 04 31.5	91 29 28.9	5,272
T. 28 N., R. 5 W., corner secs. 27, 28, 33, and 34, in northwest corner of La Rue's field, near wire fence east, and under north and south wire fence; pile of stone	37 03 38.8	91 29 29.4	5,322
T. 27 N., R. 5 W., north corner secs. 3 and 4, 58 feet east of, is south corner secs. 33 and 34, T. 28 N., R. 5 W	37 02 46.4	91 29 29.3	5,300
T. 27 N., R. 5 W., corner secs. 3, 4, 9, and 10	37 01 52.6	91 29 32.6	5,445
T. 27 N., R. 5 W., corner secs. 9, 10, 15, and 16; stone at T road west	37 01 00.4	91 29 33.3	5,279
T. 27 N., R. 5 W., corner secs. 15, 16, 21, and 22; crossroads	37 00 08.5	91 29 34.3	5,250
Birch tree, iron bench-mark post No. 50, 1913 (see Buxton quadrangle)	36 59 23.03	91 29 42.15	4,641

Along Salem, Winona & Southern Ry.

West Eminence, about 2 miles south of; road crossing	37 07 04.7	91 23 18.3	.....
Delaware spur, about 1.20 miles north of; road crossing	37 06 55.7	91 23 32.3	1,460
Delaware spur, about 0.50 mile north of; public road crossing	37 06 25.0	91 24 00.2	3,843
Delaware spur, public road crossing at	37 06 17.2	91 24 25.7	2,218
Delaware spur, 1.20 miles south of, at "8" milepost	37 05 18.9	91 24 02.8	6,180
Delaware spur, 1.60 miles south of, second-class road crossing	37 04 59.0	91 23 58.0	2,042
Delaware spur, 2.20 miles south of, over small dry creek north; small trestle bridge	37 04 28.2	91 24 03.0	3,148
Buckhart siding, 1.20 miles north of, second-class road crossing at east and west road	37 04 01.6	91 23 56.6	2,739
Buckhart siding, 0.63 mile north of; public road crossing	37 03 35.5	91 23 40.5	2,929
Buckhart siding; road crossing at	37 03 19.0	91 23 04.8	3,339
Buckhart siding, 0.65 mile south of; center of track at "4" milepost, on east side of track	37 02 45.4	91 23 07.6	3,410
Buckhart siding, 1.40 miles southwest of; opposite "3" milepost, center of track	37 02 13.4	91 23 35.2	3,931
"3" milepost, 0.50 mile southwest of; second-class road crossing	37 01 49.1	91 23 48.4	2,693
Eminence turnout, 1 mile northwest of; second-class road crossing	37 01 17.6	91 22 57.0	5,239
Eminence turnout; head block at	37 00 36.35	91 22 12.38	.....

Magnetic declination for north border of quadrangle, 6° 30′ E.; for west border 6° 30′ E.; for through center, 6° 30′ E.

EXCHANGE QUADRANGLE.

Near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 28 N., R. 3 W., south corner for secs. 34 and 35. The north corner for secs. 2 and 3 is 16 feet east of above	37 02 37.1	91 15 17.3	.....
T. 28 N., R. 3 W., in northwest quarter of sec. 35; nail in top of small stump, 15 inches high and 4 inches in diameter, 10 feet west of road in top of divide just before descending into Rocky Creek	37 03 27.2	91.14 51 3	5,484
T. 28 N., R. 3 W., corner of secs. 22, 23, 26, and 27	37 04 21.8	91 15 14.3	5,828
T road W	37 05 02.8	91 14 57.0	4,373
Forks of road, in southwest quarter of sec. 14	37 05 26.7	91 14 33.7	3,070
T. 28 N., R. 3 W., center of road at line between secs. 11 and 14; fence line west	37 06 05.8	91 14 48.0	4,118
T lane west	37 06 32.6	91 14 55.1	2,767
T. 28 N., R. 3 W., corner of secs. 2, 3, 10, and 11	37 06 59.2	91 15 10.6	2,965

EXCHANGE QUADRANGLE—Continued.

Near northwest quarter of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Forks of road in sec. 14, 33 feet east to sign board "Eminence 8 miles" and 33 feet north to sign board "Centerville 28 miles"	37 10 50.0	91 14 37.7	
T. 29 N., R. 3 W., in southeast quarter of sec. 11, 150 feet south of summit of hill in road from Current River to Blair Creek; nail in root of oak tree	37 11 35.9	91 14 17.5	4,917
T. 29 N., R.3 W., corner of secs. 1, 2, 11, and 12	37 12 08.6	91 13 58.8	3,638
Blair Creek schoolhouse, 62 feet south 52° west from southwest corner of; nail in root of blazed oak tree	37 12 27.6	91 14 03.1	1,955
T. 29 N., R. 3 W., corner on line between secs. 1 and 2, 11 and 12 on east bank of Blair Creek, about 300 feet below house of T. M. Mooney	37 13 15.1	91 13 58.0	4,822
Tps. 29 and 30 N., Rs. 2 and 3 W., 1,630 feet south and 90 feet west of, 500 feet north, 40° east of J. P. Knuckle's house, 8 feet west of road and 1 foot west of wire fence; iron post stamped "Prim. Trav. Sta. No. 54, 1913, Mo."	37 14 10.8	91 12 52.9	7,711
Tps. 29 and 30 N., Rs. 2 and 3 W., approximate corner of, location by two residents who say it is within 20 or 30 feet of corner as located by county surveyor	37 14 27.0	91 12 51.8	1,635

Near north border of quadrangle from Blair Creek to Ellington.

White-oak tree, 2 feet in diameter, on top of ridge 25 feet south of old little-used road; nail in root of tree blazed in 2 sides and marked "U. S. P. T."	37 14 07.0	91 11 39.4	6,196
Oak tree, 1 foot in diameter, 10 feet south of old roadway and 60 feet west of dim forks of road; tree blazed and marked "U. S. P. T."	37 14 21.4	91 10 26.8	6,043
Oak tree, 1 foot in diameter, 40 feet north of old dim roadway, tree blazed on two sides and marked "U. S. P. T."; nail in root of	37 14 12.5	91 09 43.6	3,613
White-oak tree, in hollow just east of and draining into Carr Creek, 1 foot south of old roadway; nail in root of tree blazed on two sides and marked "U. S. P. T."	37 14 02.6	91 08 44.5	4,879
Oak tree, 1 foot in diameter, 20 feet east of old road; nail in root of tree blazed on two sides and marked "U. S. P. T."	37 14 11.3	91 08 12.0	2,779
Oak tree, 14 inches in diameter, 10 feet south of road; nail in root of tree blazed on two sides and marked "U. S. P. T."	37 14 24.0	91 07 23.6	4,116
T. 30 N., R. 2 W., 1,220 feet west of, 490 feet north of, southeast corner, 44 feet north 35° east from northeast corner of Mr. George's house at corner of yard fence; iron post stamped "Prim. Trav. Sta. No. 55, 1913, Mo."	37 14 27.5	91 06 34.0	4,025
T. 30 N., R. 2 W., southeast corner of sec. 36. The northeast corner of sec. 1, T. 20 N., R. 2 W., should be about 390 feet east, but was not found	37 14 22.7	91 06 18.9	1,317
T. 29 N., R. 1 W., in sec. 5, 75 feet north 25° west from northwest corner of church building; nail in root of oak tree 15 inches in diameter	37 13 54.6	91 04 56.5	7,240
T. 29 N., R. 1 W., in sec. 4, at angle of road, 600 feet south of house; nail in root of hickory tree	37 13 41.7	91 03 16.5	8,194
Exchange post office and store building, 70 feet west of, in front of frame dwelling house; nail in root of walnut tree	37 13 37.0	91 01 59.2	6,276
Oak tree, 20 inches in diameter, 5 feet south of center of road; tree blazed on two sides and marked "U. S. P. T."	37 13 52.7	91 00 38.9	6,684
Tps. 29 and 30 N., Rs. 1 E. and 1 W., on fifth principal meridian township corner	37 14 18.3	90 59 48.4	4,834

Magnetic declination for west border of quadrangle, 6° 15′ E.; for north border, 5° 48′ E.

FORDLAND QUADRANGLE.

Along highways.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 29 N., R. 18 W., forks of road in sec. 4	37 14 55.0	92 54 32.7	5,624
T. 29 N., R. 18 W., corner of secs. 4, 5, 8, and 9	37 13 51.4	92 55 01.3	6,829
T. 29 N., R. 18 W., in east part of sec. 8, 5 miles north of Fordland, east side of road, 69 feet south 67° west from southwest corner of church; iron post stamped "Prim. Trav. Sta. No. 34, 1913, MO."	37 13 19.5	92 55 07.9	3,274
T. 29 N., R. 18 W., crossing of line between secs. 8 and 17	37 12 59.7	92 55 14.8	2,083
Crossroads near center of sec. 17	37 12 34.0	92 55 27.1	2,780
T. 29 N., R. 18 W., corner of secs. 19, 20, 29, and 30; fence corner about 400 feet east of church building	37 11 17.2	92 56 11.5	8,555
T. 29 N., R. 18 W., corner of secs. 29, 30, 31, and 32; at T road east	37 10 25.0	92 56 13.0	5,281
T. 28 N., R. 18 W., north corner for secs. 5 and 6; the south corner for secs. 31 and 32 is 184 feet west of above	37 09 32.7	92 56 12.1	5,300

Along St. Louis & San Francisco R. R. from Fordland to Seymour.

Fordland station, 1,100 feet east of, 250 feet north of track, at corner of road north to Marshfield, 4 feet north of concrete walk and 37 feet north 78° east from southeast corner of church building; iron post stamped "Prim. Trav. Sta. No. 35, 1913, Mo."	37 09 27.2	92 56 12.5	555
T. 28 N., R. 18 W., north corner for secs. 4 and 5, corner is 65 feet north of railroad track. The south corner for secs. 32 and 33 is 130 feet west of above	37 09 30.8	92 55 07.3	5,287
Road crossing in southwest quarter of sec. 34	37 09 33.7	92. 53 52.4	6,070
T. 29 N., R. 18 W., apparent corner of secs. 25, 26, 35, and 36, which is 64 feet north of center of track	37 10 15.1	92 51 50.7	10,709
Diggins station, 150 feet west of, 24 feet north of track, 15 feet west of roadway; iron post stamped "Prim. Trav. Sta. No. 36, 1913, Mo."	37 10 19.1	92 51 15.1	2,906
T. 29 N., Rs. 17 and 18 W., crossing of range line. (The southeast corner of sec. 25 should be near railroad; but could not be found)	37 10 14.9	92 50 45.1	2,471
T. 29 N., R. 17 W., corner of secs. 29, 30, 31, and 32; corner is 700 feet north of railroad	37 10 13.0	92 49 37.2	5,500
Road crossing	37 10 05.3	92 48 48.0	4,054
Road crossing	37 09 42.5	92 47 50.8	5,174
T. 29 N., R. 17 W., south corner for secs. 33 and 34. This corner is 876 feet south of railroad and the north corner for secs. 3 and 4 is 286 feet east of above	37 09 18.8	92 47 27.0	3,081
T. 28 N., R. 17 W., quarter corner between secs. 2 and 3. This corner is 615 feet south of railroad	37 08 50.1	92 46 18.6	6,246
Seymour station, 175 feet west of, 35 feet north of track, 5 feet west of concrete sidewalk and 3 feet from telephone pole; iron post stamped "Prim. Trav. Sta., No. 37, 1913, Mo."	37 08 52.9	92 46 10.2	744
T. 28 N., R. 17 W., crossing of line between secs. 1 and 2	37 08 43.2	92 45 14.8	4,589

Magnetic declination for northwest quarter of quadrangle, 7° 07′ E.; for east-central part, 6° 55′ E.

LEBANON QUADRANGLE.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 35 N., R. 16 W., corner of secs. 19, 20, 29, and 30; crossroads	37 44 50.7	92 43 46.6	2,655
T. 35 N., R. 16 W., T road east at quarter corner between secs. 29 and 30	37 44 24.5	92 43 47.3	2,650
T. 35 N., R. 16 W., stone at corner of secs. 29, 30, 31, and 32; T road west	37 43 58.2	92 43 48.0	2,660
T. 35 N., R. 16 W., stone at south corner of secs. 31 and 32; T roads east, west, and north	37 43 05.8	92 43 48.9	5,302
T. 35 N., R. 16 W., 440 feet east of south corner for sections 31 and 32, on south side of township line and public road, at edge of wood and in line with posts on telephone line; iron post stamped "Prim. Trav. Sta. No. 29, 1913, Mo."	37 43 05.5	92 43 43.4	441
T. 34 N., R. 16 W., northwest corner of township; T road south	37 43 06.8	92 44 43.3	4,815
T road west, 90 feet north of T road east	37 42 37.6	92 44 41.4	2,965
T road west, 55 feet north of T road east	37 41 58.3	92 44 40.6	3,970
T road east, 90 feet south of a second-class T road west	37 41 31.4	92 44 40.0	2,726
T. 34 N., R. 17 W., southeast corner of sec. 1. (The southwest corner of sec. 6, R. 16 W., is 75 feet south and marked by stone)	37 41 05.9	92 44 40.0	2,580

LEBANON QUADRANGLE—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 34 N., R. 17 W., quarter corner on east side sec. 12. (The quarter corner west side of sec. 7 is 70 feet south of above	37 40 39.5	92 44 39.6	2,670
T. 34 N., R. 17 W., stone corner at southeast corner of sec. 12; T road west at High Prairie schoolhouse. The stone corner at southwest corner of sec. 7 is 85 feet south of above at T road east	37 40 13.5	92 44 39.2	2,630
T. 34 N., R. 17 W., T road west at quarter corner on east side sec. 13; the quarter corner on west side of sec. 18 as indicated by fence line east is 115 feet south of above	37 39 47.4	92 44 38.7	2,640
T. 34 N., R. 17 W., T road west at southeast corner of sec. 13. The southwest corner of sec. 18 is 90 feet south of above at T road east	37 39 21.2	92 44 38.4	2,650
T. 34 N., R. 16 W., southwest corner of sec. 19. This corner is 310 feet north of crossroads	37 38 27.7	92 44 37.4	5,411
T. 34 N., R. 17 W., quarter corner on east side sec. 25. The quarter corner on west side of sec. 30 is 100 feet south of above	37 38 02.6	92 44 36.9	2,540
T. 34 N., R. 17 W., T road east at southeast corner of sec. 25. The southwest corner of sec. 30 is 100 feet south of above	37 37 36.6	92 44 36.3	2,635
T. 34 N., R. 16 W., quarter corner of west side of sec. 31	37 37 10.6	92 44 35.7	2,633
Tps. 33 and 34 N., Rs. 16 and 17 W.; corner of townships at fence west	37 36 44.2	92 44 35.2	2,670
T. 33 N., R. 17 W.; stone quarter corner of east side of sec. 1	37 36 18.1	92 44 34.7	2,640
T. 33 N., R. 17 W.; southeast corner of sec. 1	37 35 52.0	92 44 34.6	2,635

Magnetic declination for northwest quarter of quadrangle, 7° 10′ E.

LONG LANE QUADRANGLE.

Along St. Louis & San Francisco R. R. from Huben Spur to Conway.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Huben spur, 18 feet north of center of track, 15 feet west of road crossing, 5 feet east of cattle-guard fence, 45 feet south 54° west from switch stand; iron post stamped "Prim. Trav. Sta. No. 30, 1913, Mo."	37 35 12.23	92 45 05.47	4,733
T. 33 N., R. 17 W., approximate corner of secs. 11, 12, 13, and 14; location is 300 feet west of road crossing and 50 feet south of center of track	37 35 00.4	92 45 39.3	2,976
T. 33 N., R. 17 W., corner of secs. 14, 15, 22, and 23	37 34 09.5	92 46 43.5	7,298
Same position, Springfield astronomic value [a]	37 34 14.0	92 46 48.5	.....
Philipsburg station, center of track	37 33 10.7	92 47 05.2	6,200
Same position, Springfield astronomic value [a]	37 33 15.2	92 47 10.6	.....
Road crossing, in sec. 33	37 32 09.0	92 47 59.6	7,619
Road crossing, in sec. 5	37 31 10.8	92 49 09.8	8,165
T. 32 N., R. 17 W., corner of secs. 4, 5, 8, and 9; corner is 1,245 feet east of railroad	37 30 43.0	92 48 53.2	3,112
Conway station; center of track opposite semaphore	37 30 02.8	92 49 14.1	4,396
Same position, Springfield astronomic value [a]	37 30 07.3	92 49 19.8	.....

[a] U. S. Geol. Survey Nineteenth Ann. Rept., pt. 1, p. 160, 1898.

Magnetic declination for northeast quarter of quadrangle, 7° 10′ E.; for southeast quarter, 7° 15′ E.

MACOMB QUADRANGLE.

Along St. Louis & San Francisco R. R. from Macomb to Mountain Grove.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Macomb flag station, 350 feet northeast of, 70 feet southeast of center of track, 2 feet from fence corner; iron post stamped "Prim. Trav. Sta. No. 40, 1913, Mo."	37 05 38.2	92 29 28.8	4,095
Crossing of north and south fence line in northwest quarter of sec. 21	37 06 23.4	92 28 47.0	5,692
Center of track on north and south line in northeast quarter of sec. 21. A road runs north and one east and west along track	37 06 33.8	92 28 18.1	2,570
Road crossing, on line between secs. 22 and 23	37 06 19.4	92 26 57.0	6,726
T. 28 N., R. 14 W., corner of secs. 14, 15, 22, and 23; at T road north	37 06 35.8	92 26 56.3	1,654
T. 28 N., R. 14 W., corner of secs. 13, 14, 23, and 24	37 06 35.0	92 25 50.4	5,338
Norwood station, 66 feet N. 58° W. from northwest corner of; iron post stamped "Prim. Trav. Sta. No. 41, 1913, Mo."	37 06 28.0	92 24 59.3	4,216

MACOMB QUADRANGLE—Continued.

Along St. Louis & San Francisco R. R. from Macomb to Mountain Grove—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 28 N., R. 13 W., west corner for secs. 18 and 19. A road east on section line, road west on a jog south corner, is 327 feet south of railroad	37 06 21.7	92 24 45.0	1,304
T. 28 N., R. 13 W., corner of secs. 17, 18, 19, and 20; corner stone 593 feet north of railroad	37 06 20.5	92 23 41.2	5,171
Road crossing	37 06 39.4	92 22 47.6	4,748
T. 28 N., R. 13 W., quarter corner between secs. 16 and 17, about 50 feet southeast of railroad track	37 06 45.5	92 22 35.1	1,180
T. 28 N., R. 13 W., corner of secs. 9 and 10, 15 and 16; fence south and east at point 320 feet south of railroad	37 07 10.9	92 21 28.8	5,951
T. 28 N., R. 13 W., quarter corner between secs. 10 and 11; corner is 540 feet north of railroad	37 07 36.3	92 20 23.8	5,863
Milepost 266, center of track	37 07 22.2	92 19 15.5	5,710
Road crossing in range line between Rs. 12 and 13 west	37 07 41.1	92 18 14.2	5,322
T. 28 N., R. 12 W., center of track at line between secs. 7 and 8	37 07 30.0	92 17 08.7	5,422
Road crossing	37 07 34.1	92 16 20.0	3,962
Mountain Grove station, 1,260 feet east of, 50 feet south and 25 feet east of street crossing, 4 feet from corner of right-of-way fence; iron post stamped "Prim. Trav. Sta. No. 42, 1913, Mo."	37 07 40.8	92 15 30.1	4,098

Magnetic declination along east–west line through center of quadrangle, 7° 15′ E.

MONTEER QUADRANGLE.

Along Current River Branch St. Louis & San Francisco R. R. near Mountain View to Birch Tree.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Road crossing	36 59 27.4	91 44 19.5	5,490
T. 27 N., R. 7 W., quarter corner betweeen secs. 20 and 29; corner is 130 feet south of railroad	36 59 26.8	91 44 13.9	452
Mountain View station, 760 feet west of, 57 feet north of center of track and about 6 feet higher, 200 feet west of public road, 2 feet from wire fence line; iron post stamped "Prim. Trav. Sta. No. 48, 1913, Mo."	36 59 37.1	91 42 16.6	9,575
Road crossing (the quarter corner between secs. 22 and 23 is 437 feet north of crossing)	36 59 44.7	91 41 30.8	3,794
Road crossing	36 59 49.2	91 40 42.7	3,932
T. 27 N., R. 7 W.; crossing of line between secs. 23 and 24	36 59 50.1	91 40 24.6	1,472
Road crossing	36 59 43.2	91 39 51.4	2,785
Howell-Shannon county line, and line between ranges 6 and 7 W.; center of track at. (The east corner for secs. 24 and 25, T. 27 N., R. 7 W., is 1,420 feet south of track and marked by rock at road west. The west corner for secs. 19 and 30, T. 27 N., R. 6 W., is 1,274 feet south of track at road east)	36 59 36.5	91 39 22.2	2,460
T. 27 N., R. 6 E., quarter corner between secs. 19 and 30. This corner is 20 feet east of road crossing	36 59 23.2	91 38 50.4	2,915
T. 27 N., R. 6 E.; crossing of line between secs. 29 and 30	36 59 06.8	91 38 17.7	3,126
Teresita spur; road crossing at	36 59 01.9	91 37 45.6	2,650
Center of track at line between secs. 28 and 29, quarter corner near but could not be found	36 58 55.0	91 37 13.6	2,684
Center of track at line between secs. 27 and 28	36 58 44.6	91 36 07.7	5,454
T. 27 N., R. 6 W.; apparent quarter corner between secs. 26 and 27. This corner is about center of track at point 95 feet west of road crossing	36 58 54.3	91 35 02.6	5,370
Monteer station, 190 feet west of, 15 feet north of track and 80 feet east of section house, 18 inches from corner of fence; iron post stamped "Prim. Trav. Sta. No. 49, 1913, Mo."	36 58 53.0	91 34 39.7	1,865
Road crossing from which the corner of secs. 25, 26, 35, 36, T. 27 N., R. 6 W., is 750 feet south at T road east	36 58 33.8	91 33 57.9	3,912
T. 27 N., Rs. 5 and 6 W.; center of track at range line. (The west corner near for secs. 30 and 31 as pointed out by near-by resident is 1,346 feet south of track)	36 58 39.2	91 32 52.5	5,335
T. 27 N., R. 5 W.; center of track at line between secs. 29 and 30, (quarter corner could not be found)	36 58 53.7	91 31 44.9	5,681
Road crossing	36 59 04.4	91 30 56.4	4,081
T. 27 N., R. 5 W., center of track at line between secs. 28 and 29. The corner of secs. 20, 21, 28, and 29 is 935 feet north of track	36 59 07.3	91 30 39.4	1,410
Road crossing. The quarter corner between secs. 21 and 28 is 380 feet north	36 59 12.5	91 30 06.1	2,751

Magnetic declination for north border of quadrangle, 6° 10′ E.

NIANGUA QUADRANGLE.

Along St. Louis & San Francisco R. R. from Conway to Marshfield.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Conway station, 1,000 feet southwest of, 110 feet northwest of Frisco track, in rear of section house, 2 feet east of northeast corner of board fence surrounding Catholic church grounds. Cupola of two-story brick school building bears south 82° 30′ west and is distant about 250 feet; iron post stamped "Prim. Trav. Sta. No. 31, 1913, MO."	37 29 53.6	92 49 18.4	1,002
T 32 N., R. 17 W., corner of secs. 17, 18, 19, and 20, at T road west; corner is 75 feet west of railroad	37 28 59.4	92 50 00.9	6,459
Same position, Springfield astronomic value [a]	37 29 03.4	92 50 06.4	.....
T. 32 N., R. 17 W., corner of secs. 19, 20, 29, and 30; corner is 200 feet west of railroad	37 28 06.6	92 50 02.2	5,339
Road crossing in sec. 30	37 27 43.1	92 50 03.5	2,382
Sampson flag station; road crossing at	37 26 27.6	92 50 30.3	7,940
Tps. 31 and 32 N., center of track at crossing of township line, between secs. 31 and 6	37 26 22.5	92 50 27.2	573
Road crossing in sec. 6	37 26 01.0	92 50 21.8	2,219
T. 31 N., R. 17 W., crossing of sec. line between secs. 6 and 7, at point about 150 feet south of road crossing	37 25 30.2	92 50 20.2	3,117
Road crossing, about 40 feet east of line between secs. 17 and 18	37 24 11.9	92 50 07.9	7,979
T. 31 N., R. 17 W., corner of secs. 17, 18, 19, and 20, 540 feet west of railroad	37 23 45.4	92 50 09.2	2,686
Same position, Springfield astronomic value [a]	37 23 23.6	92 50 15.9	.....
Niangua station, center of track at semaphore	37 23 14.9	92 49 56.2	3,260
Same position, Springfield astronomic value [a]	37 23 20.1	92 50 02.4	.....
Niangua station, 830 feet south of, 60 feet west of center of track, 3 feet north of fence line; iron post stamped "Prim. Trav. Sta. No. 32, 1913, MO."	37 23 06.8	92 49 54.1	830
T. 31 N., R. 17 W.; iron pin on line between secs. 31 and 32 and one-fourth mile south of corner of secs. 29, 30, 31, and 32. Point is 285 feet north of center of track	37 21 47.9	92 50 12.4	8,120
Tps. 30 and 31 N., Rs. 17 and 18, W.; crossroads one-fourth mile south of township corner; crossroads are 835 feet north of railroad track	37 20 56.6	92 51 22.9	7,695
Tp. 30 N., R. 18.; road crossing on line between secs. 1 and 12	37 20 18.0	92 51 57.0	4,784
T. 30 N., R. 18 W., corner secs. 2, 3, 10, and 11. This corner is 1,460 feet north of railroad track	37 20 20.2	92 53 36.3	8,021
Same position, Springfield astronomic value [a]	37 20 24.3	92 53 42.6	.....
Marshfield station, center of track at semaphore	37 20 10.2	92 54 14.6	3,254
Same position, Springfield astronomic value [a]	37 20 14.3	92 54 23.0	.....
Marshfield station, 450 feet east and 500 feet south of, 40 feet west of center of north and south street on lot belonging to T. B. Pamplin; iron post (north meridian post) marked "Prim. Trav. Sta. No. 33, 1913, MO."	37 20 05.1	92 54 09.1	677

[a] U. S. Geol. Survey Nineteenth Ann. Rept., pt. 1, p. 160, 1898.

Along highways from Marshfield south 5 miles.

	° ′ ″	° ′ ″	*Feet.*
Marshfield station, one-half mile south and one-half mile east of, 600 feet west of north and south road, cut-stone U. S. Coast Survey meridian monument	37 19 41.8	92 53 43.8	3,121
T. 30 N., R. 18 W., corner of secs. 10, 11, 14, and 15 at lane west	37 19 27.9	92 53 36.4	1,533
T. 30 N., R. 18 W., corner of secs. 14, 15, 22, and 23, second-class crossroad	37 18 35.4	92 53 36.9	5,310
T. 30 N., R. 18 W., corner of secs. 22, 23, 26, and 27, T road east	37 17 42.9	92 53 37.2	5,310
T. 30 N., R. 18 W., corner of secs. 26, 27, 34, and 35; stone corner	37 16 50.4	92 53 37.5	5,310
Tps. 29 and 30 N., township line between; center of road at	37 15 58.4	92 54 04.7	5,697
Forks of road	37 15 49.0	92 54 16.4	1,340

Magnetic declination for center of quadrangle, north and south, 7° 15′ E.

PASSOVER QUADRANGLE.

Along Linn Creek and Lebanon highway.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Tps. 38 and 39 N., Rs. 16 and 17 W., corner of; an unmarked stone on bank of Linn Creek at south side of road in eastern edge of village of Linn Creek	38 04 05.9	92 44 06.8	.....
Forks of road in sec. 7	38 03 01.2	92 43 14.1	7,788
T. 38 N., R. 16 W., quarter corner between secs. 7 and 8; fence corner	38 02 45.5	92 43 06.4	1,698
T road east at apparent line between secs. 8 and 17	38 02 20.2	92 42 45.1	3,078

Magnetic declination for southwest part of quadrangle, 7° 45′ E.

REDFORD QUADRANGLE.

Along public road from Ellington to Centerville.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
White-oak tree, as above	37 15 50.2	90 58 20.6	
T. 30 N., R. 1 E., apparent line between secs. 20 and 29; oak tree hacked on all sides in center of road; a lane leads west and 305 feet west of tree is a fence line south which may be at quarter corner between secs. 20 and 29	37 16 05.1	90 58 12.0	1,658
Oak tree 12 inches in diameter, 20 feet south of road, near gate blazed and marked "U. S. P. T."	37 16 53.8	90 57 46.3	5,347
T. 30 N., R. 1 E., approximate corner of secs. 17, 18, 19, and 20. No mark, but near-by resident says it is within 15 or 20 feet of corner	37 16 48.0	90 58 35.5	4,019
T. 30 N., R. 1 E., northwest corner of sec. 18, in field; a fence runs north and south and one east	37 17 42.3	90 59 42.2	7,701
T. 30 N., R. 1 W.; fence east and west line between secs. 1 and 12	37 18 35.3	91 00 00.0	5,543
T. 30 N., R. 1 W., in northeast quarter of sec. 1; nail in root of oak tree 20 inches in diameter, east side of road opposite church. A schoolhouse near church	37 19 08.6	90 59 52.1	3,433
T. 30 N., and 31 N.; point about 700 feet east of road just on east bank of dry run and in east and west fence running west of north. This is close to principal meridian, but Mr. Falkenberg says corner is 30 to 40 yards east of creek bed	37 19 21.4	90 59 39.0	1,666
T. 31 N., R. 1 E., approximate quarter corner on west side sec. 31, in Mr. Falkenberg's garden; no mark	37 19 48.1	90 59 40.8	2,711
Oak tree, 15 inches in diameter, 15 feet east of road, blazed and marked "U. S. P. T."	37 20 38.9	90 58 40.8	7,063
T. 31 N., R. 1 E., near center of sec. 29, 35 feet east from corner of schoolhouse; nail in root of oak tree 12 inches in diameter	37 21 06.3	90 58 12.0	3,616
T. 31 N., R. 1 E., approximate corner of secs. 19, 20, 29, and 30; location by Mr. Wilson, who lives close by	37 21 24.7	90 58 34.0	2,574
Forks of road, signboard "Ellington 12 miles"; nail in root of oak tree	37 21 43.2	90 58 32.1	1,847
T. 31 N., R. 1 E., sec. 17, 70 feet south of Ed Fear's house, in rail fence line; iron post stamped "Prim. Trav. Sta. No. 57, 1913, Mo."	37 22 49.6	90 58 17.2	6,825
Centerville, 2.8 miles south of, 20 feet west of road near top of hill, nail in root of oak tree 8 inches in diameter	37 23 55.8	90 57 53.8	6,950
Centerville, 1.8 miles south of, 5 feet west of road; nail in root of oak tree blazed and marked "U. S. P. T."	37 24 43.3	90 57 47.3	4,835
T. 32 N., R. 1 E., corner of secs. 28, 29, 32, and 33; corner is 660 feet east of road	37 25 45.8	90 57 22.00	6,647
Centerville, public school building, center of cupola	37 25 59.8	90 57 29.5	1,536
Centerville Baptist Church, spire of	37 26 00.7	90 57 28.9	100
Centerville Methodist Church, spire of	37 26 01.8	90 57 30.0	141
T. 32 N., R. 1 E., in sec. 20, white oak tree 2 feet in diameter, 40 feet north of road; nail in root of	37 27 12.8	90 58 06.2	7,753
T. 32 N., R. 1 E., in sec. 20; forks of road	37 27 15.3	90 58 08.4	313
Maple tree at forks of road, blazed and marked "U. S. P. T."; nail in root of	37 28 17.2	90 57 36.6	6,769
Forks of road, old timber road northwest near cabin and site of old sawmill	37 28 33.9	90 57 36.1	1,687
T. 32 N., R. 1 E., in sec. 6, about 0.8 mile east of fifth principal meridian, 4.4 miles north and 1.2 miles west of Centerville on high ridge between Brushy Creek and west fork of Black River; aluminum tablet in bowlder marked "Prim. Trav. Sta. No. 13, 1907"; 480 feet distant is nail in root of blazed tree to which the observed azimuth is 169° 28′ 30″	37 29 52.0	90 58 47.7	9,784

Magnetic declination for west border of quadrangle, 6° 18′ E.

RUBLE QUADRANGLE.

Along public roads.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Tps. 29 and 30 N., Rs. 1 E. and 1 W., township corner on fifth principal meridian	37 14 18.3	90 59 48.4	
Ellington station, 210 feet south and 600 feet west of, 20 feet south of public road; iron post stamped "Prim. Trav. Sta. No. 56, 1913, Mo."	37 14 29.1	90 58 20.0	7,232
T. 29 N., R. 1 E., quarter corner on north side of sec. 5. The quarter corner on south side of sec. 32 is 50 feet east of above; corners are directly east of railroad water tank	37 14 08.2	90 58 08.9	2,295
White-oak tree on east side of road in fence line, nail in root of; tree blazed and marked "U. S. P. T."	37 15 50.2	90 58 20.6	10,363

SINKIN QUADRANGLE.

Along highways near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 30 N., R. 4 W., approximate corner secs. 27, 28, 33, and 34; red-oak tree on side of steep bluff	37 15 28.4	91 21 29.5	
Randolph's residence, 100 feet west of, in notched root of white-oak tree; a 20d. spike (bent over)	37 15 45.9	91 21 47.4	2,287
Randolph's residence, 0.90 mile southwest of, on top of ridge, 15 feet northeast of pine tree, just east of road track; black-oak tree, in notched root of, nail	37 15 30.0	91 22 40.6	4,586
Randolph's residence, about 1.90 miles southwest of, 20 feet west of pine tree, just north of wagon track; black-oak tree, in notched root, nail	37 15 07.9	91 23 45.7	5,716
On ridge, old gateway, no fence	37 15 05.8	91 26 06.7	
Forks of road, on top of ridge, road south leads to Mr. Rinehart's house; center of grass triangle	37 15 10.1	91 26 44.0	3,048
T. 30 N., R. 5 W., 0.25 mile west of south corner of secs. 35 and 36 (this corner is in field and not marked), 20 rods west of north corner secs. 1 and 2, T. 29 N., R. 5 W. (not marked); pile of stone	37 15 59.7	91 26 32.6	5,099
Old church building, 30 feet south of southwest corner of, at summit of hill; center of road at	37 15 41.4	91 28 44.8	10,845
T. 30 N., R. 5 W., corner secs. 27, 28, 33, and 34 (the location of above corner is according to description given by Mr. Marion Shedd, who says corner should be about 30 feet west of pine witness tree just east of road)	37 15 33.8	91 29 03.0	1,664
Ink post office, and store about 650 feet south of, 500 feet north of Mr. Marion Shedd's house, on west side of public road, close to wire fence; iron bench-mark post stamped "Prim. Trav. Sta. No. 9, 1914, Mo."	37 15 21.5	91 29 04.8	1,253

Magnetic declination south border of triangle, 6° 30′ E.

SLEEPER QUADRANGLE.

Along public road between Linn Creek and Decaturville.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T road west in section 32	37 59 23.2	92 42 32.7	
T. 38 N., R. 16 W., quarter corner between secs. 32 and 33 (about 650 feet north of public road)	37 59 16.3	92 42 09.5	1,983
Tps. 37 and 38 N., T road east on line between at point about 1,100 feet east of southwest corner of sec. 33 (not found)	37 58 50.0	92 41 55.5	2,892
T. 37 N., R. 16 W., crossing of line between secs. 4 and 9	37 57 57.8	92 41 46.6	5,319
Decaturville, 4.2 miles north of, in northwest quarter of sec. 9, on east side Decaturville and Linn Creek road, 79 feet north from northwest corner of church building; iron post stamped "Prim. Trav. Sta. No. 26, 1913, Mo."	37 57 39.9	92 42 03.6	2,268
T. 37 N., R. 16 W., crossroads on line between secs. 8 and 17	37 57 06.3	92 42 31.3	4,064
T. 37 N., R. 16 W., T road south on line between secs. 20 and 21	37 55 29.7	92 42 15.8	9,850
Secs. 28 and 33, crossing of line between	37 54 28.1	92 42 01.4	6,340
Decaturville, 450 feet south of store, road west	37 54 21.4	92 41 58.4	712
Decaturville, about 1 mile south of, at line between Tps. 36 and 37 N., and line between Camden and Laclede counties, on west side of road, 2 feet from fence; iron post stamped "Prim. Trav. Sta. No. 27, 1913, Mo."	37 53 35.7	92 41 57.9	4,633
Bidwell, oak tree with signboards in center of road, and about 20 feet south of road west	37 52 12.4	92 42 28.2	8,764

Between Bidwell and Eldridge.

T road north, south, and west, in south half sec. 8	37 52 03.8	92 42 38.8	1,213
T road north	37 51 51.6	92 43 46.0	5,528
T. 36 N., R. 16 W., quarter corner on west side sec. 18	37 51 26.4	92 44 40.0	5,022
T. 36 N., R. 16 W., west corner of secs. 18 and 19	37 51 00.2	92 44 41.0	2,658
T. 36 N., R. 16 W., quarter corner on west side sec. 19	37 50 33.9	92 44 41.9	2,657
T. 36 N., R. 16 and 17 W., crossroads at corner of secs. 24, 25, 19, and 30	37 50 07.7	92 44 42.9	2,650
Eldridge, 0.12 mile east of store and post office, 15 feet southeast of crossroads, 225 feet north and 10 feet east of quarter corner stone between secs. 25 and 30, T. 36 N., Rs. 16 and 17 W., 2 feet from fence corner; iron post stamped "Prim. Trav. Sta. No 28, 1913, Mo."	37 49 43.6	92 44 43.8	2,441

SLEEPER QUADRANGLE—Continued.

Geographic positions between Eldridge and St. Louis & San Francisco R. R.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 36 N., Rs. 16 and 17 west, T road east at corner of secs. 30 and 31, 25 and 36	37 49 15.2	92 44 44.8	2,881
T. 36 N., R. 16 W., T roads east, west, and south at quarter corner between secs. 30 and 31	37 49 14.1	92 44 07.8	2,974
T. 36 N., R. 16 W., stone quarter corner on south side sec. 31 (the stone quarter corner on north side sec. 6, T. 35 N., is 318 feet west of above)	37 48 21.9	92 44 09.7	5,285
T road east, in southeast quarter of sec. 7	37 46 48.2	92 43 56.3	9,539
T road west and lane east on line between secs. 17 and 18	37 46 22.3	92 43 43.6	2,814
T. 35 N., R. 16 W., crossroads at corner of secs. 17, 18, 19, and 20	37 45 43.1	92 43 45.0	3,962
T. 35 N., R. 16 W., quarter corner between secs. 19 and 20, T road east	37 45 16.9	92 43 45.8	2,656

Magnetic declination for northwest quarter of quadrangle, 7° 53′ E.; for southwest quarter, 7° 23′ E.

SUMMERSVILLE QUADRANGLE.

Along highways near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 29 N., R. 5 W., corner secs. 28, 29, 32, and 33, crossroads	37 08 52.4	91 30 31.8	.....
T. 29 N., R. 5 W., 150 feet west of schoolhouse; iron bench mark post stamped "Prim. Trav. Sta. No. 10, 1914, Mo."	37 08 50.9	91 30 31.6	153
T. b. m. nail in root of white-oak tree	37 07 40.2	91 30 31.7	7,153
Jacks Fork, south side of, forks of road, road down river and road south to birch tree	37 07 07.6	91 30 05.6	3,911

WILLOW SPRINGS QUADRANGLE.

Along Current River branch St. Louis & San Francisco R. R. from Willow Springs to Mountain View.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Willow Springs station, 300 feet south of, 25 feet east of yard track and 25 feet north of overhead bridge crossing tracks; iron post stamped "Prim. Trav. Sta. No. 45, 1913, Mo."	36 59 26.5	91 58 12.8	5,810
T. 27 N., R. 9 West, quarter corner between secs. 29 and 32, at road corners north, south, and east. Corner is 540 feet north of railroad	36 58 50.9	91 57 22.2	5,458
Road crossing	36 58 23.8	91 56 54.4	3,550
Road crossing; the township line between secs. 4 and 33 is about 175 feet south	36 58 01.6	91 56 01.1	4,879
T. 27 N., R. 9 W.; crossing of line between secs. 33 and 34, T line between secs. 3 and 4, T. 26 N., is 95 feet east of above	36 57 58.1	91 55 45.2	1,335
Road crossing on line between secs. 2 and 3	36 57 47.7	91 54 38.8	5,490
T. 27 N., R. 9 W., center of track at line between secs. 35 and 36. The south corner of township line appears to be under railway embankment. Line south between secs. 1 and 2, is 50 feet east	36 57 49.6	91 53 33.7	5,290
Hutton Valley station, 103 feet west of west end of, 35 feet south of center of track, 18 inches from corner fence post; iron post stamped "Prim. Trav. Sta. No. 46, 1913, Mo."	36 57 45.2	91 53 04.4	2,422
Tps. 26 and 27 N., Rs. 8 and 9 W., corner of, location said to be about 15 feet south of railway track, in line with a north and south fence	36 57 49.5	91 52 22.5	3,425
Road crossing near line between secs. 31 and 32	36 58 22.2	91 51 15.5	6,368
T. 27 N., R. 8 W., stone corner of secs. 28, 29, 32, and 33; corner is 400 feet north of track	36 58 39.0	91 50 15.2	5,182
Road crossing	36 58 47.0	91 49 58.5	1,573
Road crossing	36 58 43.7	91 48 40.0	6,375
Trask flag station, 200 feet west of, 60 feet south and 35 feet west of corner of secs. 26, 27, 34, and 35, T. 27 N., R. 8 W. (which corner is said to be between main track and siding at road crossing), 2 feet from corner fence post and about 8 feet below track; iron post stamped "Prim. Trav. Sta. No. 47, 1913, Mo."	36 58 37.3	91 48 06.2	2,826
Road crossing	36 58 48.0	91 47 16.3	4,185
T. 27 N., Rs. 7 and 8 W., center of track at line between	36 58 47.2	91 45 54.6	6,639
Road crossing near middle of sec. 30	36 58 59.7	91 45 17.7	3,254

Magnetic declination for north border of quadrangle, 6° 20′ E.

Altenburg, Campbell Hill, Chester, and Perryville quadrangles.

PERRY COUNTY.

The following geographic positions on approximate North American datum were determined by J. H. Wilson in 1913 and are based on primary traverse run in 1907, described in Bulletin 440, Mississippi River Commission p. b. m. 42 and triangulation station Brick House.

The closure on p. b. m. 42 is fair, but on distributing that closure error through the line it is found that the computed position for the chimney of brick house on bluff at Grand Eddy differs from the position given by the Mississippi River Commission by −0.58″ in latitude and −1.94″ in longitude. The brick-house chimney sighted by Mr. Wilson may not be the same as the Mississippi River Commission station, or if the same the house may have been moved.

ALTENBURG QUADRANGLE.

Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 35 N., R. 12 E., corner in center of southwest quarter of sec. 8..	37 44 57.9	89 44 11.7	.....
Crosstown, in west wall at northwest corner of foundation of Jas. Grimand's store, just inside the fence; bronze tablet stamped "Prim. Trav. Sta. No. 7, 1913"	37 44 44.2	89 43 38.6	3,000
T. 35 N., R. 12 E., corner of secs. 8, 9, 16, and 17, 0.2 mile east of Crosstown	37 44 45.3	89 43 22.2	1,316

Magnetic declination for northwest quarter of quadrangle 4° 27′ E.

CAMPBELL HILL QUADRANGLE.

Along highways near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Turn in road, small road leading to house, 200 feet north of main road	37 45 08.6	89 41 47.2	.....
Grand Eddy, St. Louis & San Francisco R. R. crossing	37 45 21.3	89 41 06.8	3,489
Grand Eddy, in north gable of brick house on bluffs; chimney (Mississippi River Commission triangulation station Brick House)	37 45 19.78	89 41 08.34	220
Grand Eddy, 640 meters below, at upper extremity of Missouri bluff, 14 meters below extreme upper point of bluff rocks, in vertical face of natural rock; center of copper bolt, letters "U. S. P. B. M." cut in rock near bolt (Mississippi River Commission P. B. M. 42)	37 45 09.74	89 40 45.33	1,945

Magnetic declination for southwest corner of quadrangle, 4° 27′ E.

CHESTER QUADRANGLE.

Along highways near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Prim. Trav. Sta. No. 2, 1907, Bulletin 440	37 45 08.7	89 58 18.4	.....
Perryville, 4 miles northeast of, road forks; 35 feet north of J. Colin's mail box	37 45 02.8	89 48 30.7	.....

PERRYVILLE QUADRANGLE.

Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Perryville, 6 miles west of, T road, Farmington-Perryville road, 450 feet southeast of house and 40 feet east of mail box	37 44 29.8	89 57 38.2	
T road south, 50 feet west of J. Tucker's mail box	37 44 21.7	89 56 56.9	3,421
T road north, 150 feet west of mail boxes	37 44 22.3	89 56 12.7	3,549
Perryville, 3.5 miles west of, north end of bridge over Saline Creek; Farmington-Perryville road	37 44 17.2	89 55 21.4	4,146
Perryville, 2.5 miles west of, T road south; Farmington-Perryville road	37 43 47.4	89 54 44.5	4,232
Perryville, 1.2 miles west of; water tank of Catholic Seminary	37 43 33.8	89 53 31.7	6,011
Perryville, west edge of; Farmington-Perryville road crossing railroad	37 43 35.0	89 53 01.7	2,413
Perryville, in south end of lower step at east entrance to courthouse; bronze tablet stamped "Prim. Trav. Sta. No. 6, 1913"	37 43 29.9	89 51 44.7	6,205
Perryville, 0.5 mile east of; road forks	37 43 32.2	89 51 06.7	3,060
Perryville, 2 miles northeast of; T road north	37 44 12.2	89 49 47.6	7,526
Ford, west bank of Cape Cinque Hommes Creek	37 44 51.9	89 47 47.6	
T road south	37 44 41.2	89 47 01.1	3,892
Crosstown, 2.8 miles west of, center of road, on hill, in front of large white house	37 44 24.0	89 46 13.8	4,180
Crosstown, 2 miles west of, west edge of ford of creek, Perryville-Crosstown road	37 44 26.0	89 45 18.2	4,474

Magnetic declination for north border of quadrangle, 4° 27′ E.

Harrisonville, Lexington, Sedalia, and Warrensburg quadrangles.

JOHNSON AND LAFAYETTE COUNTIES.

The following geographic positions on North American datum were determined by primary traverse and are based upon the positions of Baker, Chapel Hill, Cooks Knob, Normal, and Knobnoster triangulation stations (U. S. C. & G. S.). The work was done in 1914 by E. L. McNair.

HARRISONVILLE QUADRANGLE.

Along highways near south border of northeast quarter of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Baker triangulation station, about 1 mile north of Kingsville, in S. ½ E. ½ SE. ¼ sec. 25, T. 46 N., R. 29, on land belonging to Mr. Edward Baker and close to his home (house gone in 1914; only excavation to show where it stood). Permanent mark: An ale bottle filled with ashes, 2½ feet below surface. Surface mark: A marble post set flush with surface, with the letters U. S. C. S. cut on top. Two witness posts are set 5 feet north and south of the center of the surface mark	38 45 37.03	94 04 13.09	
T roads north, south, and east	38 45 39.0	94 03 08.4	5,129
T roads north, east, and west	38 45 37.0	94 02 17.8	4,009
T road north, center of east and west road at	38 45 29.5	94 01 44.5	2,720
T. 46 N., R. 28 W., corner secs. 27, 28, 33, and 34, center of east-west road at, fence line south	38 45 20.1	94 00 37.0	5,461
T. 46 N., R. 28 W., quarter corner between secs. 27 and 34	38 45 18.9	94 00 02.9	2,700

Magnetic declination, 8° 15′ E.

HARRISONVILLE QUADRANGLE—Continued.

Along highways near east border of quadrangle.

Station.	Latitude.	Londitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 48 N., R. 28 W., 15 feet south of east-west road, on line between secs. 4 and 9, 125 feet east of road north, 15 feet west of road south, 6 feet from telephone pole; iron bench-mark post stamped "Prim. Trav. Sta. No. 22, 1914, MO."	38 59 13.1	94 00 30.1	.....
T. 47 N., R. 28 W., center of sec. 9, T roads east, west, and north	38 58 47.6	94 00 33.9	2,600
T. 47 N., R. 28 W., on line between secs. 9 and 16, center of east and west road at road north	38 58 21.3	94 00 43.3	2,755
T road forks, roads east, west, and north, center of	38 57 29.4	94 01 00.0	5,413
T roads forks, roads east, west, and north, center of	38 56 37.0	94 00 56.6	5,309
T. 48 N., R. 28 W., corner secs. 21, 22, 27, and 28, road crossing	38 56 36.2	94 00 06.5	3,960
T. 48 N., R. 28 W., approximate corner secs. 27, 28, 33, and 34	38 55 43.4	94 00 09.2	5,349
T road forks, roads east, west, and south	38 55 16.4	94 00 10.1	.....
T road corners, roads east, west, and south	38 55 18.9	94 01 17.4	5,326
T road corners, roads north, south, and weast	38 55 07.6	94 02 07.8	4,152
Chapel Hill triangulation station (U. S. C. & G. S.), about 0.25 mile south-southwest of the village of Chapel Hill, in NE. ¼ SE. ¼ of sec. 1, T. 47 N., R. 29 W., about 6 feet south of middle of line bounding the 40-acre division that contains it. Station mark: A bottle filled with ashes 3 feet below surface, with a marble post 2 feet long and 6 inches square above it, with intersecting grooves and letters U. S. C. S. on face. Reference marks: Two sandstone posts, one 1.9 feet long, the other 2 feet long, 5 feet, respectively, north and south of center of surface mark, with groove and arrow pointing to center of surface mark	38 54 47.2	94 03 28.58	6,708
Johnson-Lafayette county line crossing, fence line east and west, center of road	38 54 51.0	94 00 11.9	.....
T. 47 N., R. 28 W., quarter corner secs. 3 and 4, center of public road	38 54 23.2	94 00 04.5	2,876

Magnetic declination, 8° 04′ E.

LEXINGTON QUADRANGLE.

Along highways near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Tps. 48 and 49 N., Rs. 27 and 28 W., approximate corner secs. 31, 36, 1 and 6, 200 feet north of, center of Main Street and north and south road crossing, about 3,100 feet east of Second Street, Odessa	39 00 02.2	93 56 32.9	.....
T road forks, roads east, west, and north	39 00 02.9	93 57 56.8	.....
T. 48 N., R. 28 W., apparent quarter corner north side sec. 3, T road forks, roads east, west, and north	39 00 05.5	93 59 20.4	6,599
Odessa, west of, center of tracks, at Chicago & Alton R. R. crossing	39 00 05.7	93 59 29.0	680

Magnetic declination near west border of quadrangle, 8° 38′ E.

SEDALIA QUADRANGLE.

Along highways near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 46 N., R. 24 W., east corner secs. 12 and 13, center of east and west road, on Johnson-Pettis county line	38 46 52.5	93 29 59.0	.....
T. 46 N., R. 24 W., east corner secs. 1 and 12, on north and south fence line at Johnson-Pettis county line	38 47 44.7	93 29 56.2	5,281
Tps. 46 and 47 N., Rs. 23 and 24 W., corner secs. 36, 1, 6, and 31, on Johnson-Pettis county line, center of north-south road	38 48 40.4	93 29 53.1	5,631
T. 47 N., Rs. 23 and 24 W., quarter corner secs. 36 and 31, center of north-south road at road west	38 49 06.7	93 29 51.8	2,659
T. 47 N., Rs. 23 and 24 W., corner secs. 25, 30, 31, and 36, center of north-south road, at T road west, on Johnson-Pettis county line	38 49 33.0	93 29 50.3	2,659

SEDALIA QUADRANGLE—Continued.

Along highways near west border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 47 N., Rs. 23 and 24 W., corner secs. 24, 25, 19, and 30, center of north-south road, at hedge line west	38 50 25.9	93 29 47.6	5,350
T. 47 N., Rs. 23 and 24 W., corner secs. 13, 24, 18, and 19, center of north-south road at T road west	38 51 18.0	93 29 44.6	5,270
T. 47 N., R. 24 W., east corner secs. 12 and 13, at road south and west (30 feet south of above corner is west corner secs. 7 and 8, T. 47 N., R. 23 W.)	38 52 10.4	93 29 41.5	5,305
T. 47 N., R. 24 W., southwest quarter of sec. 12, in line with center of road south, 20 feet north of center of east-west road, 4 feet south of east-west wire fence, S. 55° E. and distant 250 feet from Mr. R. S. Tyler's house, iron bench-mark post stamped "Prim. Trav. Sta. No. 16, 1914, Mo."	38 52 24.2	93 29 57.5	1,879
Public crossroads, center of	38 53 16.5	93 29 53.5	5,297
Dunksburg, 250 feet east of southeast corner of T. 48 N., R. 24 W., in center of east-west road, at crossroads on township line, granite post	38 53 58.0	93 29 51.5	4,210
T. 48 N., Rs. 23 and 24 W., corner secs. 24, 25, 19, and 30, at intersection of Pettis County line with corner of Lafayette and Johnson counties, roads north, south, and west	38 55 42.3	93 29 49.4	.....
T. 48 N., Rs. 23 and 24 W., corner secs. 13, 24, 18, and 19, intersection of corner of Saline and Pettis counties with Lafayette County line, center of north-south road	38 56 34.5	93 29 46.5	5,295
T. 48 N., Rs. 23 and 24 W., corner of secs. 12, 13, 7, and 18, on Lafayette-Saline county line, center of road north and south at road east	38 57 26.9	93 29 43.5	5,299
T. 48 N., Rs. 23 and 24 W., east corner secs. 1 and 12, on Lafayette-Saline county line, center of north-south road, 335 feet south of railroad crossing, at Emma flag station, 30 feet south to T road east	38 58 19.4	93 29 40.8	5,325
Tps. 48 and 49 N., Rs. 23 and 24 W., 16.5 feet north of stone corner in east-west road, about 10 feet west of center of road, 4 feet south of hedge north, iron bench mark post stamped "Prim. Trav. Sta. No. 17, 1914, Mo."	38 59 12.0	93 29 38.2	5,319

Magnetic declination near west border of quadrangle, 8° 00′ E.

WARRENSBURG QUADRANGLE.[1]

Along highways near west border of northeast quarter of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 47 N., R. 26 W., corner secs. 25, 26, 35, and 36, east and west crossing at gog in north-south road	38 50 03.4	93 44 27.1	.....
T. 47 N., R. 26 W., corner secs. 23, 24, 25, and 26, north-south road at T road east and fence line west	38 50 55.7	93 44 24.8	5,294
T. 47 N., R. 26 W., corner secs. 13, 14, 23, and 24, center of cross-roads	38 51 48.6	93 44 22.2	5,346
T. 48 N., R. 26 W., south corner secs. 35 and 36, at crossroads north, south, and west	38 54 21.7	93 44 34.9	.....
T. 48 N., R. 26 W., quarter corner secs. 35 and 36, center of cross-roads	38 54 47.7	93 44 33.9	2,630
T. 48 N., R. 26 W., corner secs. 25, 26, 35, and 36, center of north-south road at hedge line east and west	38 55 13.8	93 44 32.9	2,640
T. 48 N., R. 26 W., quarter corner secs. 25 and 26, in line with center of roads north and east	38 55 40.1	93 44 32.0	2,658
T. 48 N., R. 26 W., corner secs. 23, 24, 25, and 26, T road forks, east, west, and south, on Johnson-Lafayette county line	38 56 06.2	93 44 31.2	2,644

Along highways near north border of quadrangle.

T. 48 N., R. 24 W., north corner secs. 1 and 2, east-west road at T road south	38 59 14.5	93 30 46.0	.....
T. 48 N., R. 24 W., north corner secs. 2 and 3, east-west road on township line, at road south	38 59 17.4	93 31 53.7	5,354
T. 48 N., R. 24 W., north corner secs. 4 and 3, at east-west road on township line, at road south	38 59 20.1	93 33 01 1	5,331
T. 49 N., R. 24 W., quarter corner south side sec. 33, center of east-west road, in line with T road north	38 59 21.7	93 33 38.8	2,980

[1] The northeast quarter of this quadrangle is the Knob Noster 15′ quadrangle.

WARRENSBURG QUADRANGLE—Continued.

Along highways near north border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Concordia, T. 48 N., R. 24 W., 300 feet east of apparent corner of secs. 32 and 33, intersection of east-west road with center of Street S	38 59 22.6	93 34 03.8	1,977
Concordia, about 0.50 mile west of, T road corners, roads north, south, and east	38 59 23.8	93 34 46.6	3,379
Concordia, about 0.50 mile west of, north rail of track at public road crossing	38 58 59.9	93 34 48.2	2,423
Intersection public road and Missouri Pacific Railway tracks	38 59 00.0	93 35 39.6	4,062
Do	38 59 00.3	93 36 22.6	3,399
Do	38 58 50.0	93 36 49.8	2,383
Mulkey station, public road crossing at	38 58 56.2	93 37 57.2	5,358
T. 48 N., R. 25 W., in north part of sec. 2, 50 feet east and 15 feet north of road crossing Missouri Pacific Railway, 3 feet south of wire fence, 5 feet north of telephone pole, iron bench-mark post stamped "Prim. Trav. Sta. No. 18, 1914, Mo."	38 59 15.8	93 38 13.9	2,390
T road corners, center east-west road, at road north	38 59 16.1	93 38 40.7	2,115
T. 48 N., R. 25 W., at center of sec. 4, roads north, south, and west	38 59 04.7	93 40 28.8	8,612
T. 48 N., R. 25 W., quarter corner secs. 4 and 5, T road north	38 59 05.7	93 41 03.0	2,700
T. 48 N., R. 25 W., quarter corner secs. 5 and 6, east-west road at hedge north	38 59 06.4	93 42 09.7	5,268
T. 48 N., R. 25 W., middle of sec. 6, crossroads	38 59 07.1	93 42 43.2	2,650
T. 48 N., R. 25 W., quarter corner west side sec. 6	38 59 07.9	93 43 17.9	2,743
Davis Creek, center of wooden bridge over	38 59 09.0	93 44 07.4	3,912
T. 48 and 49 N., R. 26 W., is corner secs. 35 and 36	38 59 36.6	93 44 24.3	3,092

Along highways and Missouri Pacific Ry. near south border of northeast quarter of quadrangle.

Normal triangulation station (C. & G. S.)	38 45 32.997	93 44 16.442	.....
T. 46 N., R. 25 W., corner secs. 22, 23, 26, and 27, T road corners, roads east, west, and north	38 45 26.8	93 39 01.4	.....
Intersection Missouri Pacific Railway track and public road	38 46 30.6	93 38 05.8	7,814
Montserrat station, 125 feet east of public road crossing	38 46 34.7	93 37 16.2	3,956
Rs. 24 and 25 W., center of track at north and south fence	38 46 28.9	93 36 43.1	2,682
Clear Fork Creek, center of trestle over	38 46 16.3	93 35 30.8	5,869
Public road crossing, center of track at	38 46 00.4	93 34 12.3	6,420
Knobnoster station, 265 feet west of, main public road crossing	38 46 01.7	93 33 22.2	3,969
Knobnoster triangulation station, on an eminence called Knob Noster, ¼ mile from village of same name, in SW. ¼ NW. ¼ sec. 15, T. 46 N., R. 24 W. Station mark: A bottle of ashes underground and 3 stone posts for surface marks; stone over center of station is 6 inches square at top, with letters U. S. C. S. on it. The two other stones 5 inches square are 4 feet, respectively, north and south of station mark, with arrows pointing to station	38 46 35.46	93 33 07.09	3,614
T road south, center of east-west road at	38 45 51.2	93 32 00.1	6,944
T road north, center of east-west road at	38 45 49.9	93 31 26.7	2,650
T. 46 N., R. 24 W., about ¼ mile south of east corner of secs. 13 and 14, 55 feet north and 15 feet east of intersection of roads, 37 feet north of corner fence post, 1 foot east of wire fence, 25 feet east of Johnson-Pettis county line, iron bench-mark post stamped "Prim. Trav. Sta. No. 15, 1914, Mo."	38 45 47.6	93 30 02.9	6,648
T. 46 N., R. 24 W., east corner secs. 13 and 24	38 46 00.1	93 30 02.2	1,260
Intersection Missouri Pacific Railroad and Johnson-Pettis county line, center of track	38 46 22.0	93 30 00.9	2,214

Along highways near east border of quadrangle.

Blackwater Creek, center of iron truss bridge over	38 54 38.4	93 30 26.4	.....
T. 48 N., R. 24 W., ¼ corner secs. 25 and 36, center of north-south road at	38 54 51.8	93 30 26.1	1,361
T. 48 N., R. 24 W., ¼ corner secs. 24 and 25, center of T road south at east-west road on Johnson-Lafayette county line	38 55 44.2	93 30 23.7	5,309
T road forks, center of east-west road at road north	38 59 13.2	93 30 12.4	.....

Along highways through center of northeast quarter of quadrangle.

T. 47 N., R. 26 E., east corner secs. 13 and 24, on range line, T road forks north, south, and west	38 51 47.1	93 43 13.4	.....
T road forks, roads north, south, and east	38 52 10.9	93 43 11.7	2,411
T. 47 N., R. 25 W., ¼ mile east of corner of secs. 7, 8, 17, and 18, roads north, south, and east	38 52 34.7	93 41 45.5	7,232

WARRENSBURG QUADRANGLE—Continued.

Along highways through center of northern quarter of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	
T. 47 N., R. 25 W., corner secs. 8, 9, 16, and 17, east-west road at fence south	38 52 33.3	93 40 55.7	3,938
Crossroads	38 52 45.5	93 40 20.0	3,082
T. 47 N., R. 25 W., at approximate quarter corner secs. 10 and 15, right angle in road	38 52 30.2	93 39 11.9	5.605
T. 47 N., R. 25 W., secs. 10, 11, 14, and 15 crossroads	38 52 28.6	93 38 38.0	2,685
T. 47 N., R. 25 W., quarter corner secs. 11 and 14, roads east, west, and north	38 52 27.0	93 38 04.7	2,644
T. 47 N., R. 25 W., in NE. ¼ sec. 14, 7 feet north of telephone post, 20 feet west of center of north-south road, close to wire fence; iron post stamped "Prim. Trav. Sta. No. 25, 1914, Mo."	38 52 13.2	93 37 49.0	1,871
Blackwater Creek, center of truss bridge over	38 52 12.0	93 37 19.2	2,367
T. 47 N., R. 27 W., west corner of secs. 7 and 18 (45 feet south of this corner is east corner secs. 12 and 13, T. 47 N., R. 25 W., indicated by road east and fence line west)	38 52 22.9	93 36 23.8	4,517
T. 47 N., R. 24 W., corner secs. 7, 8, 17, and 18, fence north, hedge south, center east and west road at	38 32 20.7	93 35 15.1	5,442
T. 47 N., R. 24 W., quarter corner secs. 8 and 17, crossroads at	38 52 19.8	93 34 41.9	2,627
T. 47 N., R. 24 W., corner secs. 8, 9, 16, and 17, 50 feet west of iron bridge, stone in center east and west road	38 52 18.6	93 34 09.2	2,594
T. 47 N., R. 24 W., quarter corner secs. 9 and 16, T road corners, roads north, east, and west	38 52 17.7	93 33 35.6	2,655
T. 47 N., R. 24 W., ½ mile east of corner of secs. 9, 10, 15, and 16, on line between secs. 10 and 15, T road corners, roads north, south, and east	38 52 16.4	93 32 45.5	3,970
T. 47 N., R. 24 W., apparent corner secs. 10, 11, 14, and 15, east-west road at private road north to house	38 52 14.6	93 31 55.4	3,964
Cooks Knob triangulation station, a pole on the ridge of Mr. E. Cook's ice house, on the south side of the ventilator. The pole was braced firmly against the south face of the ventilator and the center of the pole is on the ridge 9 inches from the south face of the ventilator. The knob on which are Mr. Cook's house and the signal is about 7 miles distant and north from Knob Noster. It is the left-hand eminence of a range that is noticeable from Knob Noster and is in the northwest corner of the SE. ¼ sec. 14, T. 47 N., R. 24 W. (U. S. C. & G. S. station)	38 51 57.15	93 31 31.86	2,569
T road corners, roads north, south, and east	38 52 20.5	93 31 38.1	2,417
T. 47 N., R. 24 W., on line between secs. 11 and 12, T road forks near schoolhouse, roads north, south, and east	38 52 25.2	93 30 45.2	4,212

Magnetic declination along north border of northeast quarter of quadrangle, 7° 46′ E.; along south border, 8° 00′ E.; along east border, 8° 00′ E.; along west border, 7° 35′ E.; along center, 7° 43′ E.

Along highways near south border of northwest quarter of quadrangle.

T. 46 N., R. 28 W., ¼ mile south of corner of secs. 26, 27, 34, and 35, 45 feet north and 25 feet east of T road west and lane east, 5 feet east of corner of fence post, just inside fence, iron bench-mark post stamped "Prim. Trav. Sta. No. 11, 1914, Mo."	38 45 04.9	93 59 29.2	.....
T road corners, roads north, south, and east	38 45 30.8	93 59 28.0	2,618
T. 46 N., R. 28 W., in southern part sec. 26, crossroads	38 45 29.3	93 58 54.3	2,670
T road corners, roads north, south, and west, north-south road on section line	38 45 25.6	93 58 20.5	2,706
T road forks, roads north, east, and west	38 45 26.5	93 57 29.0	4,084
T. 46 N., Rs. 27 and 28 W., on range line between Rs. 27 and 28, and section line secs. 25 and 34, T road forks at roads east, west, and south	38 45 25.9	93 57 11.7	1,370
T road forks, roads north, south, and west	38 45 11.0	93 56 20.8	4,307
T. 46 N., R. 27 W., quarter corner between secs. 29 and 32, T road forks, roads north, south, and east	38 45 09.0	93 55 29.9	4,036
T road corners, roads east, west, and north	38 45 06.3	93 53 56.3	7,422
T. 46 N. R. 27 W., on line between secs. 27 and 34, in line with center of roads south and west, 20 feet north of center of road east, 4 feet north and 2 feet west of corner fence post, iron bench mark post stamped "Prim. Trav. Sta. No. 12, 1914, Mo."	38 45 05.6	93 53 30.7	2,029
T. 46 N., R. 27 W., corner secs. 26, 27, 34, and 35, center of crossroads	38 45 03.7	93 52 39.7	4,045
T. 46 N., R. 27 W., corner secs. 26, 25, 35, and 36, T road forks, roads east, west, and north	38 45 01.5	93 51 32.3	5,340

Magnetic declination near south border of northwest quarter of quadrangle, 8° 19′ E.

WARRENSBURG QUADRANGLE—Continued.

Along highways near east border of northwest quarter of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 46 N., R. 26 W., quarter corner secs. 26 and 27, north-south road at T road east	38 45 14.2	93 45 51.2	.....
Postoak Creek, center of iron truss bridge over	38 45 39.0	93 46 07.0	2,807
T. 46 N., R. 26 W., quarter corner between secs. 15 and 22, center of east-west road, at T road south	38 46 33.9	93 46 21.3	5,659
T. 46 N., R. 26 W., 0.25 mile west of corner of secs. 10, 11, 14, and 15, on section line between secs. 10 and 15, T road west	38 47 25.1	93 46 01.2	5,420
Blackwater Creek, center of iron truss bridge over	38 48 06.4	93 46 03.0	4,174
Tps. 46 and 47 N., at quarter corner on north side sec. 3, R. 26 W., in line with roads east, west, and south	38 49 15.5	93 46 13.5	7,036
T. 47 N., R. 26 W., about 0.75 mile west of corner of secs. 13, 14, 23, and 24, center of north-south road, in line with center of road east, at crossroads	38 51 51.1	93 45 13.6	.....
T road east	38 52 38.4	93 45 10.6	4,789
Fayetteville, 295 feet north of main crossroads at, 25 feet east of center of road, 6 feet west of picket fence, 8 feet south of telephone post, directly opposite church, iron bench mark post stamped "Prim. Trav. Sta. No. 20, 1914, Mo."	38 52 55.5	93 45 21.6	1,936
Fayetteville, 0.54 mile north of, T road south	38 53 23.4	93 45 26.4	2,850
Fayetteville, 0.82 mile north of, center east-west road, at road south	38 53 36.8	93 45 34.1	1,487
T. 47 N., R 26 W., north corner secs. 2 and 3, in line with center of road south and road east on township line	38 54 22.9	93 45 21.0	4,778
T. 48 N., R. 26 W., quarter corner between secs. 14 and 23, center of roads, east, west, and south, and lane north	38 56 59.6	93 45 02.6	.....
T. 48 N., R. 26 W., corner secs. 14, 15, 22, and 23, T road north	38 57 00.2	93 45 35.8	2,624
T. 48 N., R. 26 W., corner secs. 10, 11, 14, and 15, center of	38 57 52.6	93 45 34.1	5,306
Davis Creek, center of wooden bridge over	38 58 34.7	93 45 33.2	4,258
T. 48 N., R. 26 W., quarter corner secs. 2 and 3, center north and south road at T road east	38 59 11.2	93 45 32.2	3,696

Magnetic declination near east border of northwest quarter of quadrangle, 7° 35′ E.

Along highways near north border of quadrangle.

Tps. 48 and 49 N., R. 26 W., 15 feet north and 15 feet east of corner of secs. 34, 35, 2, and 3, at T road corners, roads east, west, and south, iron bench mark post stamped "Prim. Trav. Sta. No. 19, 1914, Mo."	38 59 38.6	93 45 31.3	.....
Tps. 48 and 49 N., R. 26 W., apparent quarter corner secs. 3 and 34, crossroads	38 59 39.3	93 46 04.7	2,639
T. 48 N., R. 26 W., north corner secs. 3 and 4, T road south	38 59 40.2	93 46 38.7	2,684
T road corners, roads, east, west, and north	38 59 41.7	93 47 28.7	3,955
Tps. 48 and 49 N., R. 26 W., corner secs. 5, 6, 31, and 32, T road south	38 59 44.1	93 48 52.6	6,630
Tps. 48 and 49 N., Rs. 26 and 27 W., T road east	38 59 46.1	93 49 55.9	4,999
T road corners, roads north, south, and east	38 59 34.5	93 50 59.9	5,189
T road corners, roads east, west, and south	38 59 21.6	93 51 02.4	1,319
T. 48 N., R. 27 W., in west part of sec. 2, small iron bridge over creek	38 59 22.4	93 51 30.2	2,199
T. 48 N., R. 27 W., in west half of sec. 3, in line with T road south, 15 feet north of center of east-west road, 3 feet south of water oak tree and wire fence, iron bench mark post stamped "Prim. Trav. Sta. No. 21, 1914, Mo."	38 59 24.8	93 52 26.6	4,460
T road corners, roads north, south, and east, center of	38 59 24.6	93 53 13.5	3,706
T road corners, roads north, south, and west, center of	38 59 39.5	93 53 16.9	1,540
Davis Creek, center of small wooden bridge over main branch of	38 59 42.4	93 54 39.0	6,489
Davis Creek bridge, 0.70 mile west of, T road south	38 59 44.5	93 55 26.0	3,716
Odessa Cemetery, T road west at	38 59 57.8	93 55 31.9	1,421
Odessa railroad station, about 900 feet southwest of street crossing	38 59 57.4	93 57 20.9	.....
T. 47 N., R. 28 W., apparent quarter corner secs. 3 and 4, right angle turn in road at	38 59 38.7	93 59 57.0	.....

Magnetic declination for north border of quadrangle, 7° 55′ E.

WARRENSBURG QUADRANGLE—Continued.

Along highways near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T road forks, roads north, south, and east, about 130 feet north of bridge over small stream and near church	38 55 19.8	93 59 53.8	.....
Pittsville, 2.60 miles north of, crossroads	38 53 16.5	93 59 51.3	.....
T. 47 N., R. 28 W., 0.25 mile east of corner of secs. 15, 16, 21, and 22, 15 feet south of east and west road at T road north, 5 feet north of east and west hedge line, iron bench mark post stamped "Prim. Trav. Sta. No. 23, 1914, Mo."	38 52 23.4	93 59 54.5	5,382
Pittsville, 35 feet south of center of road west, 35 feet west of center of road south, and in line with roads north and east, crossroads	38 51 02.7	93 59 24.9	8,485
T. 47 N., R. 28 W., at section line between secs. 27 and 34, roads north, south, and west	38 50 36.6	93 59 26.6	2,649
T road corners, roads north, south, and west	38 49 57.0	93 59 28.9	4,009
Tps. 46 and 47 N., crossing of north-south road at line between	38 49 43.6	93 59 29.6	1,350
T road corners, roads north, south, and east	38 49 06.1	93 59 33.0	3,808
T. 46 N., R. 28 W., on line between secs. 10 and 15, crossroads	38 47 56.6	93 59 36.7	7,034
T road corners, roads north, south, and east	38 47 30.1	93 59 38.3	2,679
T. 46 N., R. 28 W., on line between secs. 15 and 22, roads north, south, and west	38 47 03.5	93 59 40.0	2,689

Magnetic declination near west border of quadrangle, 8° 24′ E.

Along highways through center of northwest quarter of quadrangle.

T. 47 N., R. 28 W., quarter corner between secs. 26 and 27, fence line north and south, center of east-west roads	38 51 02.3	93 59 08.2	.....
T. 47 N., R. 28 W., quarter corner between secs. 25 and 26, roads north, south, and west, stone 15 feet south of center of road west.	38 51 00.0	93 58 58.0	5,379
T. 47 N., R. 28 W., corner secs. 23, 24, 25 and 26, stone	38 51 26.4	93 57 58.9	2,674
T. 47 N., R. 28 W., west corner of secs. 19 and 30, in line with road east (30 feet north of the above and in line with road west is apparent corner of secs. 24 and 25, T. 46 N., R. 28 W)	38 51 25.1	93 56 50.1	5,440
T. 47 N., R. 27 W., corner secs. 19, 20, 29, and 30, center of crossroads.	38 51 22.5	93 55 43.9	5,244
T road corners, roads east, west, and south	38 51 19.8	93 54 53.0	4,040
Blackwater Creek, center of iron truss bridge over north fork of	38 51 17.4	93 53 58.5	4,317
Columbus, T road corners, roads north, south, and west	38 51 23.9	93 53 27.5	2,540
T. 47 N., R. 27 W., corner secs. 15, 16, 21, and 22, roads north, south, and east	38 52 10.0	93 53 24.2	4,670
T. 47 N., R. 27 W., corner secs. 14, 15, 22, and 23, roads east, west, and north	38 52 07.7	93 52 15.5	5,435
T. 47 N., R. 27 W. near quarter corner secs. 14 and 23, 20 feet south and 20 feet east of intersection of crossroads, 6 feet east and 2 feet north of corner fence post, iron bench-mark post stamped "Prim. Trav. Sta. No. 24, 1914, Mo."	38 52 07.3	93 51 41.6	2,681
T. 47 N., R. 27 W., apparent corner of secs. 13, 14, 23, and 24, at angle in road near church and schoolhouse	38 52 05.9	93 51 08.3	2,635
T. 47 N., R. 27 W., east corner secs. 13 and 24, roads north, south, and west	38 52 06.5	93 49 59.3	5,461
T. 47 N., R. 26 W., corner secs. 17, 18, 19, and 20, center of, east and west road, old unused road south	38 52 00.3	93 48 53.7	5,224
T. 47 N., R. 26 W., corner secs. 16, 17, 20, and 21	38 51 57.7	93 47 45.9	5,373
T. 47 N., R. 26 W., corner secs. 15, 16, 21, and 22, roads east, west, and north	38 51 54.7	93 46 38.1	5,371
T. 47 N., R. 26 W., apparent corner secs. 14, 15, 22, and 23, near turn in roads north and east	38 51 51.6	93 45 30.3	5,368

Magnetic declination through center of northwest quarter of quadrangle, 7° 53′ E.

WARRENSBURG QUADRANGLE—Continued.

Along highways near north border of southeast quarter of quadrangle

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Intersection of highway and "Short Line" Railroad from Warrensburg to Pertle Springs	38 44 45.8	93 44 58.8	.....
T. 46 N., R. 26 W., corner secs. 25, 26, 35, and 36, center of east-west road at hedge north, and fence south	38 44 45.2	93 44 45.0	1,094
T. 46 N., R. 26 W., quarter corner secs. 25 and 36, roads east, west, and north	38 44 44.1	93 44 10.6	.....
T. 46 N., R. 25 W., west corner secs. 30 and 31 (40 feet north of above is east corner secs. 25 and 26, T. 46 N., R. 26 W., roads east, west, and north; jog at range line)	38 44 42.6	93 43 37.0	2,659
T. 46 N., R. 25 W., corner secs. 29, 30, 31, and 32, center of east and west road at T road south	38 44 40.1	93 42 25.2	5,698
T. 46 N., R. 25 W., corner secs. 28, 29, 32, and 33, center of east-west road at north-south wire fence	38 44 38.0	93 41 22.0	5,007
Sign post reading "Warrensburg 4 miles," at crossroads	38 44 37.5	93 41 04.3	1,402
T. 46 N., R. 25 W., corner secs. 27, 28, 33, and 34, center of east-west road at T road south, fence north, also line between civil townships of Warrensburg and Montserrat	38 44 36.3	93 40 11.1	4,220
T 46 N., R. 25 W., 15 feet south and 30 feet west of corner of secs. 26, 27, 34, and 35, at T road corner, roads east, west, and north; 4 feet north of fence line, iron bench mark post stamped "Prim. Trav. Sta. No. 14, 1914, Mo."	38 44 34.4	93 39 04.8	5,258

Magnetic declination near north border of southeast quarter of quadrangle, 8° 00′ E.

Along highways near north border of southwest quarter of quadrangle.

T. 46 N., R. 27 W., east corner secs. 25 and 36, roads north, south, and west (115 feet south of above corner is west corner secs. 30 and 31, T. 46 N., R. 26 W., at turn of road north and east)	38 44 59.8	93 50 23.7	.....
T. 46 N., R. 26 W., corner of secs. 29, 30, 31, and 32, center of crossroads	38 44 56.1	93 49 15.8	5,390
T. 46 N., R. 26 W., corner secs. 28, 29, 32, and 33, center of crossroads	38 44 53.3	93 48 07.7	5,409
T. 46 N., R. 26 W., corner secs. 27, 28, 33, and 34, center of east-west road at fence north and south	38 44 51.0	93 47 01.1	5,280
T. 46 N., R. 26 W., corner secs. 26, 27, 34, and 35, 20 feet north and 25 feet east of intersection of crossroads at, 5 feet east of corner fence post; iron bench mark post stamped "Prim. Trav. Sta. No. 13, 1914, Mo."	38 44 48.3	93 45 52.5	5,446

Magnetic declination near north border of southwest quarter of quadrangle, 7° 50′ E.

KENTUCKY.

PRIMARY TRAVERSE.

Fords Ferry, Golconda, Kuttawa, Providence, and Smithland quadrangles.

CRITTENDEN AND LIVINGSTON COUNTIES.

The following geographic positions on Henderson astronomic datum were determined by J. H. Wilson in 1915, and are based upon United States Army Engineers' positions at Bay City and Elizabethtown, and United States Geological Survey positions previously determined by primary traverse, described in Bulletins 310 and 440.

FORDS FERRY QUADRANGLE.

Along highways through center of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T road south, 25 feet southwest to two mail boxes	37 22 25.9	88 00 11.2	2,086
Repton, 2 miles southwest of, 30 feet from road forks, railroad crossing	37 22 15.6	88 02 00.0	8,843
Repton, 3 miles southwest of, railroad crossing	37 21 34.3	88 02 44.3	5,505
Marion, 2 miles northeast of, at bridge "J. E. 72–5", railroad crossing	37 21 18.9	88 03 11.2	2,663
Marion, ¾ mile northeast of railroad crossing	37 20 21.8	88 04 04.3	7,197
Marion, in northeast corner of Crittenden County courthouse yard; iron post stamped "Prim. Trav. Sta. No. 1, 1915"	37 20 04.2	88 04 49.4	4,055
Marion, 1.40 miles west of, 25 feet northeast of wire fence, T road	37 19 48.2	88 06 21.2	7,587
Marion, 2.10 miles west of, 45 feet northwest of mail box No. 2, road forks	37 19 47.7	88 07 06.5	3,655
Marion, 3.80 miles west of, 50 feet southeast of telephone pole No. 60, road forks	37 20 51.5	88 08 22.8	8,920
Marion, 4.70 miles west of, 18 feet west of west end of bridge over Hurricane Creek, at road leading up to Mary Bell mine; road forks	37 20 48.9	88 09 19.3	4,573
Hurricane Creek, 0.87 mile west of, at top of ridge, road forks	37 20 45.6	88 10 15.8	4,575
Hurricane Creek, 1.90 miles west of, at white house, road forks	37 21 10.2	88 11 16.0	5,454
Sheridan, road forks at store	37 21 13.1	88 11 57.9	3,400
Sheridan, 1 mile northwest of, just east of Deer Creek church, at G. D. Humphrey's mail box, road forks	37 21 51.3	88 12 44.8	5,410
Sheridan, 1.50 miles northwest of, at sign, "Posted by R. L. Williams," on tree road forks	37 22 00.0	88 13 16.9	2,737
Sullingers schoolhouse, about 900 feet north of, 415 feet north of T road east, 20 feet east of intersection of Salem-Tolu and Lola-Tolu roads; iron post stamped "Prim. Trav. Sta. No. 2, 1915"	37 22 08.7	88 14 23.0	5,404

Along highways near Ohio River.

Wooden bridge over creek, 100 feet south of, road north	37 26 29.7	88 13 34.7	.....
Elm tree, at fence corner, 15 feet north of, center of road at gate in fence	37 26 29.7	88 12 29.7	5,247
Sycamore tree, on south side of road, 25 feet east of, at crossing of small creek, center of road	37 26 36.7	88 11 18.3	5,803
John Shaffer's residence, about 300 feet west of, 45 feet east of locust tree with board showing high-water mark of Apr. 5, 1913, road forks	37 26 44.9	88 10 32.1	3,817
Second-class crossroads at top of hill, oak tree in center of triangle	37 26 43.1	88 09 49.4	3,444
Casad post office, northeast corner of porch of J. E. Phillips & Co.'s store	37 26 48.4	88 09 04.0	3,707
Casad post office, 0.80 mile east of, T road west	37 26 57.4	88 08 14.0	4,128
Casad post office, 1.40 miles northeast of, 20 feet north of crooked walnut tree on east side of road, T road west	37 27 20.4	88 07 47.2	3,186
Fords Ferry, 70 feet south of T road east, on east side of north and south road, 2 feet west of northwest corner of post-office yard; iron post stamped "Prim. Trav. Sta. No. 8, 1915"	37 28 01.6	88 06 34.5	7,192

FORDS FERRY QUADRANGLE—Continued.

Along highways near Ohio River—Continued.

Station.	Latitude.	Longitude	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Fords Ferry, 0.80 mile east of, 700 feet northwest of W. L. Clements residence, 50 feet south of river bank and on the west side of a small creek, large sweet-gum tree; nail in blaze on west side and 3 feet above ground	37 28 05.0	88 05 40.9	4,331
Weston, 0.40 mile west of, prominent pointed rock, on rocky point, rock is black around base and has a scratch mark on river side	37 28 18.2	88 04 43.8	4,797
Weston, locust tree at center of cross streets (described before as an elm tree, but there is no question but that the locust tree was located)	37 28 27.7	88 04 18.9	2,229

Along highways near west border of quadrangle.

Tolu, on north side of east and west street, 7 feet north and 12 feet west of northwest corner of Southern Methodist Church, Farmers & Merchants Bank on northeast corner; iron post stamped "Prim. Trav. Sta. No. 7, 1915"	37 26 08.8	88 14 42.6	.....
Tolu, 0.90 mile south of, center of triangle at road forks	37 25 22.6	88 14 42.1	4,683
Tolu, 3.40 miles south of, road forks at cemetery	37 23 28.1	88 14 58.9	.....
Liberty Grove Church, about 300 feet southwest of, just north of house, road forks	37 21 18.9	88 14 14.8	.....
Liberty Grove Church, 1.20 miles south of, at A. L. Cooper's mail box, road forks	37 20 15.7	88 14 14.5	6,390
Pleasant Grove schoolhouse, 400 feet north of, 700 feet south of crossroads at foot of hill, on hillside, crossroads	37 19 47.6	88 14 01.2	3,040
Pleasant Grove schoolhouse, 1.70 miles south of, five mail boxes on wheel, center of crossroads	37 18 21.6	88 13 54.7	8,714
Salem, 1 mile northeast of, 20 feet southeast of "American Lady Shoe" sign on oak tree, road forks	37 16 45.0	88 14 13.7	9,887
Salem, at northwest corner of crossroads, on bank; iron post stamped "Prim. Trav. Sta. No. 3, 1915"	37 15 57.8	88 14 35.6	5,098
Salem, 0.86 mile south of, 20 feet southwest to telephone pole, road forks	37 15 32.1	88 13 49.8	4,532

Along highways near south border of quadrangle.

J. I. Clements residence, just south of T road forks	37 15 04.2	88 07 33.4	.....
Enon, 2 miles west of, four mail boxes on revolving frame at southwest corner of crossroads; center of crossroads	37 15 01.1	88 01 02.9	.....

Magnetic declination on north border of quadrangle 4° 20′ E.; on south border, 4° 26′ E.; on east border, 4° 27′ E.; on west border, 4° 42′ E.; in center, 4° 35′ E.

GOLCONDA QUADRANGLE.

Along highways through center of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Golconda (in Illinois), in northwest corner of courthouse yard, and 71 feet northwest of U. S. A. Engineers' bench mark, in center of triangle formed by supports of city fire bell; iron post stamped "Prim. Trav. Sta. No. 10, 1913 Illinois"	37 22 05.0	88 29 02.8	.....
Comptons Landing, in fence line, on north side of road, and at edge of river bank; flagstaff	37 21 19.0	88 28 21.6	5,729
Comptons Landing, 0.68 mile east of, crossroads	37 21 14.1	88 27 37.5	3,600
Comptons Landing, 1.40 miles northeast of, at road leading to Middle Landing, road forks	37 21 49.5	88 27 31.4	3,610
Berry Ferry, 60 feet south of southeast corner of post-office porch, center of road forks	37 22 20.4	88 27 32.0	3,110
Berry Ferry, 0.90 mile northeast of, 180 feet south of small iron bridge, 25 feet north and 15 feet east of mail box, road forks	37 23 02.7	88 27 06.5	4,737
Berry Ferry, 1.45 miles northeast of, center of road at second-class crossroads between house and barn	37 23 31.5	88 27 08.4	2,914
Berry Ferry, 2.70 miles northeast of, 180 feet southeast of right-angle turn in road, at road leading through gate to edge of river, just west of house, T road southwest	37 24 27.4	88 26 23.1	6,724

GOLCONDA QUADRANGLE—Continued.

Along highways through center of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
McElroy Landing, 1.30 miles southwest of, 180 feet east of second-class road at gate, just east of small pond, west end of small iron bridge	37 24 48.5	88 25 00.4	7,002
McElroy Landing, about 200 feet south of, center of road at gate (there is no road to landing, only a path through cornfield)	37 24 58.3	88 23 38.8	6,653
McElroy Landing, 0.50 mile southeast of, center of iron bridge over small creek	37 24 44.3	88 23 11.5	2,632
Carrsville, at southeast corner of crossroads at Albert Boyd's store, first cross streets south of river and post office; iron post stamped "Prim. Trav. Sta. No. 6, 1915"	37 23 58.1	88 22 20.5	6,227
Carrsville, 0.70 mile southeast of, 270 feet west of house on hillside on north side of road, at second-class road, gate	37 23 39.4	88 21 39.5	3,814
Carrsville, 1.34 miles southeast of, just west of creek, road forks	37 23 26.3	88 21 02.5	3,265
Carrsville, 2.14 miles southeast of, about 600 feet west of old mine at top of ridge, between white oak tree on north side and gate on south side of road, center of road	37 23 19.8	88 20 11.1	4,202
Carrsville, 2.90 miles southeast of, 25 feet northeast of corner of picket fence, 30 feet northwest of intersection of wire fence and rail fence, T road south	37 23 13.4	88 19 21.0	4,095
Crawford schoolhouse, opposite front door, center of road	37 22 51.6	88 19 08.2	2,443
Crawford schoolhouse, 0.90 mile southeast of, 100 feet east of road south, 10 feet east of intersection of wire and picket fences, second-class road east, road forks	37 22 10.2	88 18 37.9	4,859
Deer Creek, center of ford at Livingston-Crittenden county line	37 21 59.8	88 18 06.2	2,770
Deer Creek, 0.66 mile southeast of ford at, in front of W. H. Clark's residence, telephone pole	37 21 42.4	88 17 29.0	3,480
Deer Creek, 1.50 miles southeast of ford at, center of bridge	37 21 33.5	88 16 33.3	4,585
Sullingers schoolhouse, 1.10 miles west of, in front of mail box No. 51, road forks	37 22 16.7	88 15 43.3	5,940

Along highways near west border of quadrangle.

Bay City (in Illinois), 70 feet north of Glass's store, 30 feet west of center of north and south road, U. S. Army Engineers' bench-mark post	37 15 03.1	88 29 47.6	.....
Bay City, 0.75 mile northeast of, lane southwest to cornfield, in river bottom at Threlkeld's residence	37 15 21.6	88 29 03.3	3,982
Bay City, 2.16 miles northeast of, second-class road through gate to river bottom, road forks	37 16 30.9	88 29 34.6	7,465
Bay City, 2.70 miles north of, 100 feet east of house with white-washed front, road forks at road east	37 16 35.2	88 29 03.1	2,575
Bay City, 3.60 miles north of, on east bank of bayou, forked cypress tree	37 17 13.2	88 29 35.1	4,639
Comptons Landing, 3.90 miles south of, right-angle turn in road, at road west to river bottom, 25 feet north of "No Hunting" sign by O. Kuebler	37 18 09.3	88 28 53.3	6,610
Comptons Landing, 2.90 miles south of, about 300 feet southwest of a house and 150 feet west of another house, at road west through gate to river bottom, crossroads	37 18 58.9	88 28 33.5	5,278
Comptons Landing, 0.90 mile southeast of, 60 feet east of gate, 10 feet south of oak tree, near bend in road, road forks	37 20 40.6	88 27 49.7	10,886

Along highways near south border of quadrangle.

Sandy Creek, south end of bridge over	37 15 53.2	88 16 12.3	.....
Center of crossroads, 15 feet west of wooden culvert	37 15 53.6	88 16 45.7	2,698
Old Salem schoolhouse and church, wooden culvert at road forks between	37 15 58.7	88 17 24.0	3,135
O. T. English's and C. C. Alsobrook's mail boxes	37 15 24.9	88 18 42.5	7,202
G. W. Riddle's mail box, 230 feet west of, 20 feet north of telephone pole No 2560, T road north	37 15 15.3	88 19 50.4	5,567
T road southeast, just west of three mail boxes	37 15 02.0	88 20 22.3	2,902
Road forks, T road north	37 15 10.0	88 25 37.2	.....
Culbert schoolhouse, at northeast corner of yard, road forks	37 15 09 2	88 26 13.7	2,948
McMurray's chapel, 700 feet northeast of, T road southwest	37 15 33.5	88 26 57.3	4,294
McMurray's chapel, 0.90 mile southwest of, T road east	37 15 00.4	88 27 39.1	4,743
L. Highfils mail box (No. 68), 25 feet south of, at top of rise, road forks	37 24 05.7	88 15 24.5	.....
Mail box No. 69, near second-class road forks	37 24 47.8	88 15 20.9	4,280
Tolu, 1 mile southwest of, ¼ mile northeast of J. L. Franklin's brick residence, road forks	37 25 48.0	88 15 04.7	.....

GOLCONDA QUADRANGLE—Continued.

Along highways in northeast quarter of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
J. A. Worley's mail box (No. 3), 25 feet east and 25 feet north of, at top of ridge, oak tree at second-class road fork	37 25 47.0	88 16 24.8	6,463
Fred Hill's residence, about 400 feet south of, at forks of road, C. E. Donakey's mail box	37 25 20.7	88 17 07.3	4,328
Concrete bridge, in Ohio River bottom	37 25 52.6	88 17 25.8	3,565
Elizabethtown, at landing opposite, pole with ferry bell and flag	37 26 05.1	88 18 21.9	4,704
Elizabethtown (in Illinois), on limestone point on bank of river, directly in front of Rose House, 5 feet west of summer house, a triangle and letters "U. S." cut in solid rock, U. S. Engineers' base-line triangulation station	37 26 46.2	88 18 11.8	4,240

Magnetic declination along north border of quadrangle, 4° 32′ E.; along south border, 4° 25′ E.; along east border, 4° 42′ E.; along west border, 4° 25′ E.; in center, 4° 34′ E.

KUTTAWA QUADRANGLE.

Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Dry Creek, center of bridge over	37 14 50.0	88 12 51.4	.....
S. L. Shelby's store, 40 feet southeast of corner of store porch	37 14 19.7	88 12 38.8	3,226
J. C. Kinsolving's house, 250 feet south of, T road west	37 14 12.6	88 11 55.5	3,575
Emmaus Church, about 800 feet northeast of, 100 feet west of covered bridge over Clay Lick Creek, road forks	37 14 51.2	88 10 37.9	7,397
Emmaus Church, 1.20 miles east of, 20 feet east of mail box No. 35A, road forks	37 14 55.8	88 08 55.4	8,303
J. A. Patton's mail box, at road southwest, about 500 feet east of road, northeast	37 14 16.8	88 06 27.5	.....
Mexico, about 0.30 mile north of depot, 150 feet east of J. T. Nelson's store, 60 feet west of T road south, center of east and west road, at railroad crossing	37 14 11.8	88 05 35.3	4,253
Fredonia, about 1.50 miles northwest of, 25 feet south and 30 feet west of T. W. Young's mail box (No. 13), in triangle formed by intersection of Marion-Fredonia State road and Salem-Fredonia road; iron post stamped "Prim. Trav. Sta. No. 4, 1915"	37 13 56.4	88 04 48.4	4,100
Fredonia, about 1.50 miles northeast of, opposite front gate of residence of Joe Guess, center of Enon-Fredonia road	37 14 06.6	88 02 09.5	12,910

Magnetic declination along north border of quadrangle 4° 26′ E.

PROVIDENCE QUADRANGLE.

Along highway near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Repton and Tribune, crossroads halfway between, in northwest corner of R. Newcomb's farm; nail in blaze on walnut tree bears S. 81° 45′ E., 112.9 feet, nail in blaze on small oak bears S. 89° W., 34 feet; iron post stamped "Prim. Trav. Sta. No. 15, 1906"	37 22 35.1	87 59 48.1	.....
Enon, at northeast corner of church, just south of T road east	37 15 15.7	87 59 21.8	.....
Enon, Walnut Grove church, at corner of old Polk farm, at T lane northeast, about ¾ mile northeast of Enon; nail in small black oak bears S. 79° 25′ E., 13.3 feet, T road northeast bears S. 28° 30′ E., 35 feet; iron post stamped "Prim. Trav. Sta. No. 16, 1906"	37 15 34.1	87 58 43.9	3,585

SMITHLAND QUADRANGLE.

Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Burna, 160 feet northeast of post office, T road southwest	37 14 48.2	88 21 33.0	.....
Burna, 0.58 mile southwest of, on east side of north and south road at T road west; iron post stamped "Prim. Trav. Sta. No. 5, 1915"	37 14 22.2	88 21 52.5	3,063
Burna, 2 miles west of, 110 feet east of bridge over small creek, T road north	37 14 43.5	88 23 24.1	7,712
Burna, about 2.50 miles west of, at Midway schoolhouse, center of road forks	37 14 42.7	88 23 54.6	2,463
Midway schoolhouse, about 0.40 mile west of, 75 feet north of road forks at road leading up creek, road forks at road leading down creek	37 14 44.7	88 24 22.2	2,234
Bayou, 115 feet northeast of post office, T road forks	37 14 47.5	88 28 31.4	.....

Magnetic declination along north border of quadrangle 4° 25′ E.

TRIANGULATION STATIONS.

Goodloe, Inez, and Paintsville quadrangles.

FLOYD, JOHNSON, MAGOFFIN, AND MORGAN COUNTIES.

In the summer of 1915 C. L. Nelson extended triangulation over the above-named quadrangles, starting from Collins Rock, Porter, and Standifer stations, on North American datum.

In addition to reoccupying these three stations, Mr. Nelson occupied five stations and located four points by intersections.

BRUSH CREEK, FLOYD COUNTY, KY. (Not occupied.)

Flag in top of oak tree, at head of Grassy Creek. Station was not occupied, but it is fairly open and can be occupied by topographer.

Station mark: Oak signal tree.

[Latitude 37° 30′ 55.95″. Longitude 82° 53′ 25.04″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Quicksand	.....	.....	3.6900906	3.044
Hicks	.....	6 36 27.40	3.5735542	2.328
Collins Rock	.....	91 17 15.90	4.0140178	6.418

COE FLAG, MAGOFFIN COUNTY, KY. (Not occupied.)

Flag in 8-inch black oak on top of knob on property of Albert Coe at head of Puncheon Creek, Gun Creek, and Big Ditch Fork of Middle Creek. Flag is about 1½ miles south of Ivyton.

Station mark: Center of oak signal tree.

[Latitude 37° 40′ 53.57″. Longitude 82° 58′ 09.39″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Preston	200 57 57.88	20 59 45.84	4.0815157	7.497
Webb	254 37 00.05	74 40 53.82	3.9874018	6.036

COLLINS ROCK, FLOYD COUNTY, KY.

On a high cleared knob between the forks of Beaver Creek and about 4 miles above their junction. It is at head of Turkey Branch and Henry Branch of Right Fork of Beaver Creek, and may be reached from either fork.

Signal: Quadripod of usual form set on center.

Station mark: Aluminum-bronze tablet set flush in solid rock.

Reference marks: (1) Chisel mark (+) on rock; distance 8.28 feet, true azimuth 188° 29′. (2) Chisel mark (+) on rock; distance 7.20 feet, true azimuth 285° 04′. (3) Chestnut oak 20 inches in diameter; distance 24.74 feet, true azimuth 32° 28′.

Aluminum tablet had been destroyed. It was replaced by bronze tablet.

[Latitude 37° 30′ 48.63″. Longitude 82° 46′ 24.59″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Quicksand	76 59 28.24	256 53 45.71	4.1519805	8.817
Hueysville	83 35 00.41	263 32 55.69	3.7043490	3.146
Brushey Creek	91 17 15.90		4.0140178	6.418
Hicks	111 47 04.01	291 42 58.59	4.0273465	6.618
Preston	156 38 01.26	336 32 38.57	4.5131857	20.255
Webb	159 35 23.88	339 32 07.02	4.3550107	14.072
Porter	190 47 10.23	10 49 01.29	4.3766449	14.791
Ivy	238 52 40.17	58 58 25.18	4.2101409	10.081
Stratton	276 33 27.16	96 45 00.29	4.4496061	17.497

HUEYSVILLE, FLOYD COUNTY, KY. (Not occupied.)

Flag set on rock and braced by branches of tree on knob, about 1 mile east of Hueysville and 1 mile southeast of junction of Brush Creek and Right Fork of Beaver. Station can be occupied.

Station mark: Old bolt was found set in rock at foot of flag.

[Latitude 37° 30′ 30.23″. Longitude 82° 49′ 49.41″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Hicks	132 52 57.38	312 50 57.49	3.8218690	4.123
Collins Rock	263 32 55.69	83 35 00.41	3.7043490	3.146

MILLERS FLAG, MAGOFFIN COUNTY, KY. (Not occupied.)

Station mark: Flag in oak tree on top of knob, about 1 mile east of Millersville, on Mine Fork.

[Latitude 37° 48′ 20.84″. Longitude 82° 59′ 40.09″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Peach Orchard		354 07 31.97	4.2731041	11.654
Preston		111 08 17.19	3.8454842	4.353

NELSON, LAWRENCE COUNTY, KY.

On a cleared knob between the right and left forks of George Creek, about 2 miles northeast of Lowmansville. It can be reached from Jim Bryant's place on Nelson Branch of Left Fork.

Station mark: Bronze triangulation tablet countersunk and cemented in rock.

Reference marks: (1) Chisel mark (+) on rock, distance 16.90 feet, true azimuth 155° 26′; (2) chestnut tree 18 inches in diameter, distance 23.20 feet, true azimuth 150° 38′.

Signal: Quadripod of usual form set on center.

[Latitude 37° 57′ 16.485″. Longitude 82° 43′ 56.125″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Preston	41 02 33.497	220 55 38.039	4.4017842	15.672
Peach Orchard	94 59 20.446	274 48 51.496	4.3987861	15.565
Anthony	282 53 32	103 08 52	4.57015	23.094
Hurricane	311 34 37.004	131 43 24.455	4.4487441	17.462
Standifer	346 34 12.267	166 35 52.653	4.2360553	10.701

PEACH ORCHARD, MORGAN COUNTY, KY.

On partly cleared knob at head of Fife Branch of Blain Creek, on the property of Leo Skags. Reached via Big John Ferguson's place on Open Fork of Paint Creek.

Signal: Quadripod of usual form set over center.

Station mark: Bronze tablet in rock set in ground.

Reference marks: (1) White-oak stump of old signal tree 36 inches in diameter, 107 feet distant, true azimuth 2° 50″; (2) oak tree, 14 inches in diameter, leaning toward north, 186 feet distant, true azimuth 45° 49″; (3) peach tree 8 inches in diameter, 19 feet distant, true azimuth 93° 33′.

[Latitude 37° 58′ 25.91″. Longitude 83° 00′ 58.52″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Nelson	274 48 51.496	94 59 20.446	4.3987861	15.565
Standifer	303 00 00.177	123 12 08.423	4.5389719	21.494
Preston	338 13 47.576	158 27 19.771	4.3579744	14.169
Millers Flag	354 07 31.966	... .	4.2731041	11.654

PORTER, FLOYD COUNTY, KY.

On an east-west ridge on the north side of Johns Creek about 2.5 miles (air line) above the mouth, between the properties of Lee Hall and John Porter. Station is best reached by following ridge to east from residence of William Nesbit.

Signal: Quadripod of usual form set over center.

Station mark: Aluminum triangulation tablet countersunk and cemented in solid rock.

Reference marks: (1) Chisel mark (+) on rock, distance 7.95 feet, true azimuth 304° 47′; (2) chisel mark (+) on rock, distance 10.65 feet, true azimuth 59° 10′.

[Latitude 37° 43′ 27.06″. Longitude 82° 43′ 22.69″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Collins Rock	10 49 01.29	100 47 10.23	4.3766449	14.791
Hicks	36 27 58.29	216 22 01.20	4.3829495	15.007
Webb	80 07 17.98	260 02 09.48	4.0982839	7.792
Preston	110 39 05.94	290 31 51.08	4.2688842	11.541
Standifer	199 49 57.77	19 51 17.42	3.9721055	5.827
Flag	289 42 03.94	109 50 31.89	4.3350551	13.440
Brandy Keg	327 25 39.25	147 27 08.20	3.8209275	4.114
Ivy	327 51 40.30	147 55 34.98	4.2484148	11.009

PRESTON, JOHNSON COUNTY,

On cleared knob at head of Barnett Creek, about 7 miles southwest of Paintsville. It can be reached by way of Will Blair's residence on Barnett Creek.

Signal: Chestnut-oak tree 10 inches in diameter which forms southern support for observing structure 20 feet high. Tree is 7.8 feet distant; true azimuth 0° 55′.

Station mark: Bronze tablet in rock set in ground.

Reference marks: Fence corner between properties of Blair, Blanton, and Salyers, distance 30.8 feet, true azimuth 110° 55′; black-oak tree, 1 foot in diameter, on fence line between Salyers's and Blairs's properties, distance 167 feet, true azimuth 177° 10′; stump of old signal tree; large chestnut tree 4 feet in diameter, distance 44.6 feet, true azimuth 319° 35′.

[Latitude 37° 46′ 58.93″. Longitude 82° 55′ 12.93″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Quicksand	1 27 44.74	181 27 23.73	4.5202281	20.586
Coe Flag	20 59 45.84	200 57 57.88	4.0815157	7.497
Millers Flag	111 08 17.19		3.8454842	4.353
Peach Orchard	158 17 19.77	338 13 47.57	4.3579744	14.169
Nelson	220 55 38.04	41 02 33.49	4.4017842	15.672
Standifer	263 34 32.86	83 43 07.80	4.3156842	12.854
Porter	290 31 51.08	110 39 05.94	4.2688842	11.541
Webb	329 52 09.76	149 54 15.80	4.0021168	6.244
Collins Rock	336 32 38.57	156 38 01.26	4.5131857	20.255
Hicks	353 14 10.58	173 15 27.24	4.4174560	16.248

QUICKSAND, FLOYD COUNTY,

On a high ridge separating the headwaters of Quicksand Creek from Salt Lick Creek, 3 miles northwest of Hippo post office.

Station mark: Bowlder in ground, in top of which is cemented a bronze triangulation tablet.

Reference marks: (1) Chestnut-oak tree 2 feet in diameter; distance 6.6 feet, true azimuth 165° 04′; (2) position of former signal tree and station mark (recently blown down); distance 13 feet, azimuth 16° 00′.

Old stone with tablet had been removed; replaced by bronze tablet in stone set in ground in same position.

[Latitude 37° 29′ 04.65″; longitude 82° 55′ 47.34″ from north. Latitude 37° 29′ 04.52″; longitude 82° 55′ 47.19″ from south.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
From north:				
Preston	181 27 23.727	1 27 44.742	4.5202281	20.586
Collins Rock	256 53 45.712	76 59 28.238	4.1519805	8.817
From south:				
Lost	50 37 18.14	230 28 01.35	4.4653955	18.145
Frazier	291 47 34.35	111 57 06.21	4.3964679	15.482
Beaver	323 30 08.82	143 37 19.47	4.4681256	18.259
Walnut	350 29 56.16	170 31 19.40	4.3106744	12.706

STANDIFER, JOHNSON COUNTY.

On a high cleared knob between main Greasy Creek and Pigeon Roost Fork, at head of Buffalo Creek. It can be reached from Greasy Creek or from Pigeon Roost Fork.

Signal: 26-inch chestnut, oak tree; distance 7.8 feet, true azimuth 127° 13′.

Station mark: Aluminum tablet countersunk and cemented in sandstone 28 by 20 by 14 inches.

[Latitude 37° 48′ 13.17″. Longitude 82° 41′ 12.63″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Porter	19 51 17.37	199 49 57.72	3.9721055	5.827
Webb	54 47 16.462	234 40 48.050	4.2792061	11.818
Preston	83 43 07.803	263 34 32.858	4.3156842	12.854
Peach Orchard	123 12 08.423	303 00 00.177	4.5389719	21.494
Nelson	166 35 52.653	346 34 12.267	4.2360553	10.701
Hurricane	276 23 42.60	96 30 48.92	4.2337179	10.643
Brandy Keg	358 29 57.29	178 30 06.71	4.1585556	8.952

WEBB, FLOYD AND JOHNSON COUNTIES.

Cleared hill about 1 mile north of Bonanza on Abbott Creek. Best reached by going up Conley Branch about half a mile and climbing spur. Properties of Dutch Webb, B. A. Conley, and Thomas Stanley join on the hill.

Signal: Hickory tree, 14 inches in diameter, distance 5.8 feet, true azimuth 190° 48′. Tree leans so that flag in tree is directly over station. (All angles were read to flag.)

Station mark: Bronze tablet in stone 6 by 8 by 14 inches, set in ground.

Reference marks: (1) Property corner between B. A. Conley, Dutch Webb, and Thomas Stanley, distance 207 feet, true azimuth 328° 44′; (2) black-gum tree, 10 inches in diameter, distance 102 feet, true azimuth 35° 59′.

[Latitude 37° 42′ 16.98″. Longitude 82° 51′ 47.00″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Hicks	6 31 20.98	186 30 31.86	4.2402324	10.804
Coe Flag	74 40 53.82	254 37 00.049	3.9874018	6.036
Preston	149 54 15.80	329 52 09.76	4.0021168	6.244
Standifer	234 40 48.050	54 47 16.462	4.2792061	11.818
Porter	260 02 09.480	80 07 17.983	4.0982839	7.792
Collins Rock	339 32 07.126	159 35 23.885	4.3550107	14.072

HICKS, FLOYD-MAGOFFIN COUNTIES, KY.

Cleared knob at head of Left Fork of Middle Creek and Brushy Fork of Licking River. Station is near north edge of large flat sandstone rock, on highest part of knob, where properties of James Allen, John M. Hale, and Smith Hicks corner.

Signal: Tall pine 18 inches in diameter, distant 28.1 feet, true azimuth 168° 35′.

Station mark: Aluminum tablet set in rock in place.

Reference marks: (1) Chestnut-oak tree, 2 feet in diameter, separating into two trunks 6 feet from ground, distant 47.7 feet, true azimuth 351° 12′; (2) cross chiseled in rock, distant 7.5 feet, azimuth 355° 22′; (3) cross chiseled in rock, distant 12.5 feet, azimuth 48° 35′.

[Latitude 37° 32′ 56.64″. Longitude 82° 53′ 07.46″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Preston	173 15 27.24	353 14 10.58	4.4174560	16.248
Webb	186 30 31.86	6 31 20.98	4.2402324	10.804
Porter	216 22 01.20	36 27 58.30	4.3829495	15.007
Collins Rock	291 42 58.59	111 47 04.02	4.0273465	6.618
Hueysville	312 50 57.49	132 52 57.38	3.8218690	4.123
Brush Creek			3.5735542	2.328

TENNESSEE AND ARKANSAS.

PRIMARY TRAVERSE.

SHELBY COUNTY, TENN.; CRITTENDEN COUNTY, ARK.

Bartlett and Memphis quadrangles.

The following geographic positions were determined by F. W. Crisp in 1915, and are based upon United States Coast and Geodetic Survey triangulation stations, Exchange, Hopefield, South Base, and Weaver, North American datum:

MEMPHIS QUADRANGLE.

Along highways and Yazoo & Mississippi Valley Railroad

Station.	Latitude.	Longitude.	Distance between stations.
TENNESSEE.			
Exchange triangulation station, a Coast and Geodetic Survey station in the city of Memphis, on the top of the Cotton Exchange Building on the corner of Second and Madison streets. A standard station mark was set flush with the surface of the concrete roof in the southeast corner of the building, 1.38 meters from the inside of the cornice on the Second Street side and 1.48 meters from the inside of the cornice on the Madison Street side, and 3.08 meters from the center of the iron flagpole	° ′ ″ 35 08 42.05	° ′ ″ 90 03 04.85	*Feet.*
Memphis, Third and Union avenues, intersection of	35 08 33.1	90 03 02.8	919
Memphis, Third and Linden avenues, intersection of	35 08 14.6	90 03 03.8	1,875
Memphis, South Third Street and East Georgia Avenue, intersection of	35 07 44.9	90 03 06.5	3,017
Memphis, intersection of southbound main track of Yazoo & Mississippi Valley R. R. and northbound main track of Chicago, Rock Island & Pacific Ry	35 07 36.9	90 03 34.4	2,456
Memphis, center of southbound Illinois Central R. R. track and center of Iowa Avenue where it crosses under railroad	35 07 28.6	90 03 34.4	840
Memphis, intersection of southbound track Illinois Central R. R. and McLemore Avenue	35 06 57.9	90 03 26.7	3,172
Memphis, center of main track Yazoo & Mississippi Valley R. R. under center of viaduct on speedway	35 06 27.6	90 03 27.3	3,070
Memphis, Rayburn Street, center of main track Illinois Central R. R. and electric railway	35 05 51.2	90 03 44.9	3,955
Horn Lake Road, center of track at intersection with, 35 feet southeast to milepost, "Memphis, 3 miles"	35 05 33.2	90 04 01.3	2,276
McLean lumberyard, 635 feet south of, under Yazoo & Mississippi Valley R. R. crossing	35 05 07.6	90 04 24.5	3,225
Noncannah Creek, iron bridge over, center of track	35 04 48.2	90 04 42.1	2,452
West Junction station, 20 feet southeast of, 15 feet west of center of main track, 35 feet north of tall switchstand at north end of Yazoo R. R. loop; iron post stamped "Prim. Trav. Sta. No. 1, 1915"	35 04 03.4	90 05 23.8	5,701
Milepost, "Memphis 6 miles," center of track at	35 04 02.8	90 06 20.5	4,703
Ensley, flag station, center of track at road crossing	35 04 06.8	90 07 35.2	6,221
Ensley, flag station, 0.90 mile southwest of, center of track at second-class road crossing	35 03 20.1	90 07 49.8	4,876
Ensley station, 2.24 miles south of, center of second-class road crossing at west loop of Yazoo & Mississippi Valley R. R	35 02 11.5	90 07 46.7	6,938
Weaver triangulation station, a Coast and Geodetic Survey station about 8½ miles south of west from Court Square, Memphis, 4 miles west of south from West Junction, and 2 miles north from Darwin railroad station, on the highest knoll on the Weaver farm, in a cultivated field, near the bluff overlooking the Mississippi River bottom, about ½ mile east from the west line of the loop of the Yazoo & Mississippi Valley R. R. The ends of the loop are at West Junction and Darwin, 1 mile west from the east line of this railroad, about 40 meters west from the "Bluff Road," which runs north and south near the bluffs through the Weaver plantation. Mark: Standard disc	35 02 24.82	90 07 35.61	1,631

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MEMPHIS QUADRANGLE—Continued.

Along highways and Yazoo & Mississippi Valley Railroad—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Fields Avenue at intersection with T road north	35 02 58.4	90 06 49.3	5,133
Fields Avenue, center of track at railroad crossing	35 02 58.7	90 06 11.6	3,130
Mount Pisgah Baptish Church, T road west at	35 02 58.8	90 05 46.9	2,050
Mount Pisgah Baptish Church, 0.50 mile south of T road east	35 02 32.8	90 05 46.6	2,634
Levi Avenue, center of intersection with T road south	35 02 34.2	90 04 40.7	5,478
Horn Lake road, intersection with T road west	35 02 34.3	90 04 09.6	2,583
Horn Lake road, intersection with T road east	35 02 07.3	90 04 10.8	2,728
Horn Lake road, intersection with Lake View road	35 01 56.2	90 04 11.2	1,127
Horn Lake road, intersection with crossroad at mail box No. 109, belonging to J. B. Bulford	35 01 15.5	90 04 04.3	4,152
Whitehaven, 0.20 mile north of station, 60 feet east of center of Illinois Central R. R. track, 5 feet south of intersection with T road north, 270 feet southeast of milepost "N. O. 386"; iron post stamped "Prim. Trav. Sta. No. 2, 1915"	35 01 15.4	90 02 18.3	8,816
Along Illinois Central Railroad.			
Whitehaven, 1 mile north of, center of main track at public road crossing	35 02 07.3	90 02 29.5	5,324
Whitehaven, 1.50 miles north of, crossing of Lake View Electric Ry. and Illinois Central R. R., center of Illinois Central R. R. track under electric railway	35 02 30.8	90 02 34.3	2,411
Whitehaven, 2.30 miles north of, center of track at second-class road crossing	35 03 14.4	90 02 48.2	4,559
Whitehaven, 2.96 miles north of, center of track at east and west public road crossing	35 03 46.6	90 02 57.3	3,333
Noncannah Creek, center of track at center of iron bridge over	35 04 17.6	90 03 03.2	3,175
Noncannah Creek, 0.30 mile north of, center of track at east and west public road crossing	35 04 32.8	90 03 06.0	1,556
Noncannah Creek, 0.75 mile north of, center of southbound track, at road crossing	35 04 56.6	90 03 10.5	2,441
Noncannah Creek, 1 mile north of, center of southbound track at east and west public road under railroad	35 05 11.4	90 03 13.3	1,510
Noncannah Creek, 2.50 miles north of, center of northbound track, "Speedway" crossing	35 06 27.4	90 03 11.1	7,679
Along highways and Illinois Central Railroad (checked spur line).			
Washington and Third streets, intersection of	35 08 54.6	90 02 54.3	.....
Jackson Avenue and Third Street, intersection of	35 09 12.5	90 02 47.2	1,903
Suffaran Avenue and Third Street, intersection of	35 09 37.7	90 02 37.1	2,687
Keel Avenue and Illinois Central R. R., intersection of	35 09 49.3	90 02 50.5	1,612
Second Street and main track Illinois Central R. R., intersection of	35 10 29.9	90 02 37.4	4,244
Plum Street and main track Illinois Central R. R., intersection of	35 10 51.2	90 02 25.4	2,371
Wolf Creek, center of Illinois Central R. R. track at center of iron bridge over	35 11 22.6	90 02 13.5	3,324
Wolf Creek, 1.10 miles northeast of, second-class road crossing	35 12 18.2	90 02 03.0	5,697
Fraser, overhead crossing of public road, center of track at	35 12 38.2	90 01 41.4	2,700
Fraser, 0.47 mile northeast of, second-class crossing, center of track at	35 12 58.5	90 01 24.7	2,470
Felts station, second-class crossing, center of track at	35 13 37.8	90 00 52.4	4,799
Felts station, 0.40 mile northeast of, center of track at public road crossing	35 13 56.9	90 00 36.6	2,330
Felts station, about 1.40 miles northeast of, 0.50 mile north of Douglas Felts store, at T road east, 21 feet west from fence corner in yard of cabin, and in line with east and west fence running from corner to railroad tracks; iron post stamped "Prim. Trav. Sta. No. 4, 1915"	35 14 40.4	90 00 13.0	4,812
Along Yazoo & Mississippi Valley Railroad.			
Memphis bridge, center of track at, east end of	35 07 33.9	90 04 21.6	.....
ARKANSAS.			
Memphis bridge, center of track at west end of	35 08 08.2	90 05 05.4	5,917
Hopefield, south base triangulation station	35 07 51.69	90 04 54.85	1,881

MEMPHIS QUADRANGLE—Continued.

Along Union Belt Line Railway and highways.

Station.	Latitude.	Longitude.	Distance between stations.
TENNESSEE.	° ′ ″	° ′ ″	*Feet.*
Common Street crossing, center of track at	35 10 25.0	90 02 08.4	.....
Morehead Avenue crossing, center of track at	35 10 23.6	90 01 29.1	3,269
Jones Avenue crossing, center of track at	35 10 22.8	90 01 02.7	2,189
Raleigh Springs Road crossing, center of track at	35 10 22.1	90 00 41.6	1,750
South-bound Parkway Drive at crossing of St. Louis & San Francisco R. R.	35 06 33.8	90 00 35.3	.....
Parkway at intersection with South Bellevue Boulevard	35 06 34.7	90 01 17.8	3,538
Westbound driveway at Parkway at intersection with Gaither Parkway	35 06 35.9	90 01 51.7	2,815
Parkway at intersection with Mississippi Boulevard	35 06 30.4	90 02 01.7	1,008
Parkway at intersection with Kerr Avenue	35 06 26.2	90 02 14.1	1,109
Parkway at intersection with Lauderdale Street	35 06 26.7	90 02 36.5	1,869
Memphis, intersection of Union Street and Belvidere Boulevard	35 08 08.7	90 00 18.0	.....
Memphis, intersection of Union and South Cleveland streets	35 08 12.7	90 00 59.0	3,438
Memphis, intersection of Union and South Somerville streets	35 08 16.1	90 01 33.3	2,872
Memphis, intersection of Union and Walnut streets	35 08 19.2	90 02 04.4	2,600
Memphis, intersection of Union Street and Southern Ry. tracks	35 08 23.1	90 02 25.3	1,783
Memphis, intersection of Union and Wellington streets	35 08 27.6	90 02 42.0	1,460
Exchange triangulation station	35 08 42.05	90 03 04.85	2,396

Along Iron Mountain Railway.

ARKANSAS.			
Hopefield south base triangulation station, a Coast and Geodetic Survey station in the village of West Memphis, about 300 meters west from the Mississippi River, 170 meters south from the railroad bridge approach, 50 meters north from the road leading west from the ferry landing, 47 meters east from the store belonging to Mr. J. A. Templin, in the rear of the house on the lot belonging to Mr. Douglas Owens and 28 meters east from his west property line and 12 meters south from his north line. The stone projects 14 inches and is marked on the south, "U. S. Coast Survey," on the west, "S. Base," and on the east, "1879"	35 07 51.69	90 04 54.85	.....
Intersection of Chicago, Rock Island & Pacific Ry. and Iron Mountain R. R.	35 08 43.9	90 06 04.3	7,822
Intersection of Chicago, Rock Island & Pacific Ry. and levee in Arkansas	35 08 33.8	90 07 30.6	7,242
Chicago, Rock Island & Pacific Ry. at point where it leaves levee, center of track at	35 08 10.2	90 09 31.8	10,340
Hulbert, 1 mile east of, intersection of tangents of Iron Mountain and Rock Island & Pacific railroads	35 08 00.4	90 10 21.8	4,270
Hulbert station, center of track opposite	35 07 45.9	90 11 36.6	6,390
Riceville, public road crossing under track at	35 07 24.5	90 13 27.4	9,450
Riceville, 0.80 mile southwest of, center of track, at second-class road crossing	35 07 15.2	90 14 15.2	4,080
Mounds Arkansas, at southeast corner of post office and general store of Mounds Lumber Co., 47 feet north of main track of Chicago, Rock Island & Pacific Ry., 1 foot south of southeast corner of porch; iron post stamped "Prim. Trav. Sta. No. 5, 1915"	35 06 54.9	90 16 03.6	9,235

Along St. Louis & San Francisco Railroad.

Frisco, at crossing of levee, center of tracks at	35 09 44.8	90 06 58.0	.....
Creek crossing under trestle, center of track at	35 10 33.1	90 08 22.4	8,539
Trestle No. 4769, second-class road crossing under center of track at	35 11 01.5	90 09 12.0	5,021
Second-class road crossing, center of track at	35 11 21.9	90 09 47.6	3,601
Road crossing, center of track at	35 11 35.7	90 10 11.7	2,441
Do	35 11 51.3	90 10 39.1	2,770
Public road crossing, center of track at	35 12 21.2	90 11 30.2	5,205
Marion station, 150 feet north of, center of main track at public road crossing	35 12 51.8	90 11 47.9	3,422
Harvard station, 420 feet west of, 600 feet south of Frisco ice plant, on west side of road, 30 feet east and 16.6 feet north of front gate at house of superintendent of ice plant; iron post stamped "Prim. Trav. Sta. No. 6, 1915"	35 14 22.3	90 12 32.7	9,877

Magnetic declination near east border of quadrangle, $5\frac{3}{4}°$ E.; in northwest quarter, from $3\frac{3}{4}°$ to $6\frac{1}{4}°$ E.; near south border of southeast quarter, 5° 26′ E.

BARTLETT QUADRANGLE.

Along Union Belt Line Railway and highways.

Station.	Latitude.	Longitude.	Distance between stations.
TENNESSEE.	° ′ ″	° ′ ″	*Feet.*
Evergreen Avenue crossing, center of track at	35 10 20.7	89 59 59.8	
McLean Avenue crossing, center of track at	35 10 20.2	89 59 43.0	1,390
Patterson Transfer Co'.s farm, on the Raleigh Springs Road, ¼ mile south of, in northwest corner of Springdale Avenue crossing of Belt Line, iron post stamped "Prim. Trav. Sta. No. 3, 1915"	35 10 18.9	89 59 00.4	3,541
Springdale Avenue crossing of Louisville & Nashville R. R., center of track at	35 09 42.5	89 59 01.9	3,683
Jackson Boulevard and Parkway Drive, intersection of	35 09 29.1	89 58 47.8	1,789
Overton Park, northeast corner of, intersection of Parkway and Speedway	35 09 03.6	89 58 51.5	2,590
East Parkway and Poplar Avenue, intersection of	35 08 25.8	89 58 57.2	3,854
Parkway and East Madison Avenue, intersection of	35 08 09.6	89 59 00.7	1,663
Parkway, under center of concrete railway bridge	35 07 45.8	89 59 01.5	2,413
Intersection of southbound drive of Parkway and Central Avenue, also of iron railroad bridge overhead	35 07 33.5	89 59 02.4	1,250
Intersection of southbound drive of Parkway and Nelson Avenue, opposite Agricultural Building of Tri-State Fair Grounds	35 07 18.5	89 59 03.0	1,510
Tri-State Fair Grounds, at southwest corner of, intersection of southbound drive of Parkway and Southern Ry. tracks	35 06 57.1	89 59 03.6	2,170
Spotswood Avenue and South Trezevant Avenue, intersection of	35 06 52.1	89 59 03.8	510
Parkway, intersection of southbound driveway of, with Carnes Avenue	35 06 47.7	89 59 29.5	2,186
Parkway Drive and South Barkdale Street, intersection of	35 06 32.3	89 59 57.0	2,762
Intersection of South Cooper and Union streets	35 08 03.2	89 59 24.5	
Intersection of Cooper Street and McLean Boulevard	35 08 06.9	89 59 59.4	2,933

LOUISIANA.

PRIMARY TRAVERSE.

Blanchard, Bossier, Hosston, Keithville, and Plain Dealing quadrangles.

BOSSIER AND CADDO PARISHES.

The following geographic positions on approximate North American datum were determined in 1915 by F. W. Crisp, jr., topographer, and are based upon United States Army Corps of Engineers permanent bench mark 45, near Bossier, and a Coast and Geodetic Survey bench mark 600 feet east of station at Greenwood.

Positions located in 1905 by Sledge Tatum, topographer, in the Blanchard quadrangle, published in Bulletin 310, have been readjusted and are included.

BLANCHARD QUADRANGLE.

North along highways and Texas & Pacific Railway from Shreveport to Belcher.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Shreveport, Market Street; center of bridge over bayou (outlet of Cross Lake)	32 31 09.3	93 45 05.9	.....
Shreveport, intersection of La Salle and Arkansas avenues; center of streets	32 31 32.4	93 45 15.0	2,462
Shreveport, 2 miles north of, T road south; center of asphalt road	32 32 03.4	93 45 45.9	4,104
Shreveport, 3 miles north of; crossing of Shreveport-Belcher asphalt road with railroad	32 32 49.6	93 46 17.5	5,396
Shreveport, 3.8 miles north of, asphalt road crossing; center of track	32 33 18.7	93 46 11.8	.....
T road east, center of asphalt road at	32 34 00.0	93 46 03.9	4,224
T road 70 feet east of railroad	32 34 56.2	93 46 19.5	5,833
Cash Point, 1 mile south of, road crossing; center of track	32 35 57.5	93 46 14.1	6,216
Cash Point, crossing of road and railroad at	32 36 44.0	93 46 08.8	4,726
Cash Point, 1.1 miles north of, road crossing; center of track	32 37 35.6	93 46 37.8	5,778
Pickett, 0.8 mile south of; crossing of asphalt road	32 38 01.2	93 46 57.0	3,060
Pickett crossing, 170 feet southeast of north cattle guard, 25 feet southwest of south cattle guard, 20 feet northeast of fence corner on right of way of Texas & Pacific Ry. and 120 feet southeast of sharp turn in levee on west bank of Red River; iron post stamped "Prim. Trav. Sta. No. 8, 1915"	32 38 32.2	93 47 20.6	3,723
T road east on asphalt road	32 38 54.9	93 47 50.2	3,422
Cattle guard on railroad, T road east at	32 39 23.7	93 48 34.2	4,750
Dixie, 2 miles south of, concrete culvert on Shreveport-Belcher road, top of east end; bronze tablet stamped "Prim. Trav. Sta. No. 9, 1915"	32 39 53.5	93 49 19.3	4,895
Dixie, 0.25 mile south of, 50 feet west of railroad; crossroads	32 41 18.6	93 50 02.7	9,362
Dixie station, 100 feet north of, road crossing; center of main track	32 41 40.1	93 50 02.1	2,180
Hayti crossing, 60 feet west of track; crossroads	32 42 46.1	93 50 02.6	6,665
Uni, 50 feet north of station, 60 feet west of track; T roads	32 44 07.3	93 50 02.4	8,205
Public road crossing, center of track at	32 44 49.3	93 50 01.6	4,254

BLANCHARD QUADRANGLE—Continued.

Along highways near north border of quadrangle from Belcher to Oil City.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Horseshoe Bayou, center of iron bridge over	32 44 47.0	93 50 46.4	3,832
Dooley Bayou, wooden bridge; T road north at west end of	32 44 47.4	93 51 50.4	5,467
T road north; center of intersection	32 44 47.1	93 52 06.1	1,347
Fence corner, center of road at	32 44 46.0	93 53 10.5	5,499
Crossroads, center of	32 44 45.4	93 53 32.2	1,850
Wooden bridge over bayou, 90 feet west of center of; T road north	32 44 45.0	93 53 48.6	1,410
Crossroads, center of	32 44 45.0	93 54 29.7	3,510
Stumpy Bayou, T roads in east side of; center of triangle at intersection	32 43 52.0	93 54 35.2	5,368
Black Bayou; east ferry landing	32 43 30.6	93 54 26.8	2,280
Crossroads, in woods northeast of oil well	32 43 25.9	93 55 41.0	6,361
Oil well, 150 feet southeast of, crossroads and telephone line; center of crossing	32 43 28.5	93 56 09.9	2,482
Pipe line, second-class road crossing at	32 43 41.1	93 56 29.0	2,070
Railroad spur track to Arkansas Gas Co.'s plant, center of road crossing on	32 44 01.6	93 57 22.2	4,992
Oil City station, 0.5 mile south of, crossing of highway and Kansas City Southern Ry.; center of main track	32 44 11.8	93 58 04.2	3,731

Along Kansas City Southern Railway and highways in western part of quadrangle from Oil City via Morningsport to Greenwood.

Milepost 538, 180 feet north of, road crossing; center of track at	32 42 47.8	93 57 36.2	8,819
Road crossing, center of track at	32 42 34.4	93 57 31.7	1,410
Ferry Lake, north side of, Southwestern Gas & Electric Co.'s power station; road crossing	32 42 21.7	93 57 30.3	1,279
Mooringsport, 100 feet north of station; road crossing	32 41 38.8	93 57 27.0	4,345
Mooringsport, 0.4 mile south of, road crossing at section house; center of main track	32 41 16.1	93 57 27.0	2,297
Old St. Lee Church, 100 feet southeast of, at crossroads, General Land Office, section corner on township line between Tps. 19 and 20 N., R. 16 W., probably secs. 1, 2, 35, and 36; iron post stamped "Prim. Trav. Sta. No. 4, 1915"	32 40 37.1	93 57 53.3	4,539
T road east; center of intersection	32 40 06.0	93 58 24.9	4,143
Wooden bridge over bayou, center of	32 39 52.2	93 58 49.4	2,526
Wooden bridge; center of	32 39 21.2	93 59 18.7	4,009
T road south, center of intersection	32 39 19.0	93 59 31.1	1,084
Road forks in pine woods	32 38 44.1	93 58 52.8	4,816
Road forks in pine woods	32 38 38.6	83 58 49.1	634
T road east; center of intersection	32 38 14.5	93 58 50.5	2,442
T road southwest, center of main road at	32 38 02.5	93 58 51.2	1,216
Crossroads, second-class road east-west	32 37 06.8	93 58 58.3	5,658
T road west to Robert Cushman's place, in triangle at intersection of; iron post stamped "Prim. Trav. Sta. No. 5, 1915"	32 36 30.8	93 58 54.5	3,657
Mount Zion Church, 150 feet north of; T road east	32 35 50.9	93 58 48.4	4,066
Mount Zion Church, 0.5 mile south of; crossroads	32 35 21.4	93 58 58.8	3,110
T road east	32 34 54.8	93 58 54.0	2,716
Road forks to west	32 34 40.6	93 58 51.9	1,450
T road east	32 34 28.2	93 58 39.6	1,638
Private road east	32 34 05.0	93 58 36.0	2,356
Longwood schoolhouse, 0.5 mile south of, in southwest corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 6, 1915"	32 33 35.2	93 58 37.8	3,018
Sojourner post office, 200 feet south of; center of crossroads	32 32 44.0	93 58 20.9	5,366
T road east	32 32 16.2	93 58 21.0	2,815
Crossroads, center of	32 31 50.2	93 58 22.9	2,638
T road east	32 31 30.2	93 58 25.1	2,025
Wooden bridge 200 feet southeast of sawmill, center of	32 31 10.8	93 58 24.7	1,964
Star Light Church, center of road opposite	32 30 38.2	93 58 14.9	3,403

Magnetic declination near north border of quadrangle, 7° 34′ E.; near west border, 8° 12′ E.; along Texas & Pacific Ry., in eastern part, 7° 21′ E.

The following geographic positions in the Blanchard quadrangle, originally published in Bulletin 310, were determined in 1905 by Sledge Tatum. They have been readjusted to fit lines run by F. W. Crisp in 1915.

Along Kansas & Texas Railway near Shreveport.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Shreveport, near Kansas City Southern Ry. crossing	32 29 34.9	93 45 36.2	.....
Cattle guard, Kansas City Southern Ry., 40 feet east of track; iron post stamped "Prim. Trav. Sta. No. 153," station mark	32 29 57.6	93 47 16.6	.....

Along Kansas City Southern Railway near Ananias.

Road crossing	32 31 22.8	93 49 04.6	.....
Milepost 552, road crossing	32 32 35.8	93 50 43.6	.....
Milepost 550	32 33 46.7	93 52 11.6	.....
Milepost 549, road crossing 500 feet north of	32 34 25.0	93 52 59.1	.....
Blanchard, 1,900 feet north of, 35 feet west of track, at south side of wagon-road crossing; iron post stamped "Prim. Trav. Sta, No. 184," station mark	32 35 13.0	93 53 42.8	.....
Road crossing	32 37 04.7	93 54 45.8	.....
Milepost 544, road crossing	32 38 06.2	93 55 31.9	.....
Milepost 542	32 39 22.3	93 56 54.1	.....
Mooringsport, 1 mile south of, 36 feet east of track, 340 feet north of road crossing; iron post stamped "Prim. Trav. Sta. No. 213," station mark	32 40 40.4	93 57 14.7	.....
Mooringsport, 100 feet north of station, road crossing	32 41 38.8	93 57 27.0	.....
Caddo flag station, road crossing, 30 feet west of track, south of road; iron post stamped "Prim. Trav. Sta. No. 259," station mark	32 45 28.0	93 58 25.3	.....
Ananias flag station, road crossing	32 44 39.1	93 58 14.3	.....

Positions of the following triangulation stations were taken from blue prints furnished October 20, 1914, by the office of the United States Army Corps of Engineers at Dallas, Tex. They were given on an assumed position for Shreveport courthouse, but from connection made by United States Geological Survey primary traverse in 1915 from bench mark 45, near Shreveport, with Shreveport courthouse a correction of 45.73″ has been added to latitudes and 56.92″ added to longitudes to reduce them to approximate North American datum. No descriptions of triangulation points are available, but each is marked by a 3-inch galvanized-iron post set in concrete.

	Latitude.	Longitude.	Elevation.
	° ′ ″	° ′ ″	*Feet.*
Shreveport courthouse	32 30 45.73	93 44 56.92	.....
East base	32 32 23.67	93 44 22.52	173.752
West base	32 32 07.23	93 45 39.35	174.253
Noel	32 33 44.66	93 46 14.32	210.818
New Mouth	32 33 53.82	93 45 41.10	176.537
T. S. & N	32 35 18.11	93 46 14.95	177.650
Grindstone	32 35 55.85	93 48 06.91	212.680
Albany Point	32 36 45.89	93 49 49.81	225.230
Albany Flats	32 38 07.25	93 50 25.04	167.887
Howell	32 37 27.24	93 50 40.85	221.858
Gum Springs	32 38 24.97	93 52 04.54	172.875
Cottonwood	32 40 01.46	93 51 58.84	170.162

BOSSIER QUADRANGLE.

From bench mark 45 along Vicksburg, Shreveport & Pacific and St. Louis Southwestern railways to Alden Bridge.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
P. b. m. 45, northwest base of 1892, on west side of levee about 15 feet south of northeast and southwest wagon road on south side of track, b. m. is 840 feet east of Bossier end Vicksburg, Shreveport & Pacific Ry. bridge and 113 feet southeast from railroad; a cottonwood tree in front of W. H. Barbour's house bears S. 32° W. 126 feet, the northeast corner of garden lot of W. H. Barbour's house bears S. 53° E. 45 feet	32 30 59.4	93 44 17.7	.....
T road north, center of	32 31 05.4	93 43 46.9	2,710
Road and railroad crossing, center of track at	32 31 05.4	93 43 31.1	1,347
Shreveport, 1 mile east of, 120 feet southwest of railroad crossing; forks of macadamized roads	32 30 58.6	93 43 10.5	1,900
St. Louis Southwestern and Vicksburg, Shreveport & Pacific railways; center of crossing of	32 31 24.3	93 43 06.2	2,627
East-west road crossing; center of main track at	32 31 57.4	93 43 19.5	3,531
Road crossing; center of track at	32 32 16.9	93 43 30.7	2,196
Honore, road crossing at; center of track	32 33 26.4	93 43 49.6	7,207
Brownlee station, road crossing at; center of track	32 34 20.3	93 43 51.1	5,452
Plantation road crossing, center of track at	32 35 39.3	93 43 54.2	7,987
Vanceville, 200 feet northwest of station, 85 feet west of center of track, 53 feet east of northeast corner of base of brick chimney in the northeast corner of yard of J. P. McCain; iron post stamped "Prim. Trav. Sta. No. 1, 1915"	32 36 12.3	93 44 06.0	3,484
Macadam road; center of crossroads on	32 36 57.8	93 44 19.1	4,728
Trestle No. 79, 80 feet northeast of; center of crossroads	32 37 41.4	93 44 33.6	4,580
Willow Chute station, 0.8 mile south of, crossroads; center of macadam road at	32 39 12.1	93 44 54.7	9,341
Willow Chute station, 600 feet north of crossroads; center of macadam road	32 39 58.6	93 44 49.1	4,720
Benton station, 1 mile south of, 100 feet east of railroad; center of crossroads	32 41 02.0	93 44 41.3	6,442
Benton station, 100 feet south of; road crossing center of main track	32 41 55.1	93 44 26.9	5,511
Benton station, 2.5 miles north of; center of track opposite gate	32 44 16.4	93 43 43.2	14,760

Along streets in Shreveport.

Marshall and Crockett streets, center of intersection of	32 30 42.1	93 44 50.6	.....
Shreveport, courthouse; dome of	32 30 45.7	93 44 56.9	660
Shreveport, post office, in northeast corner of yard of; iron post U. S. C. E. b. m.	32 30 49.7	93 44 57.7	411

Magnetic declination along railroad near west border of quadrangle, 8° 15′ E.

HOSSTON QUADRANGLE.

Along highways near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Swans Ferry, 1 mile east of; center of crossroads	32 47 28.7	93 45 39.8	.....
T roads; center of intersection of	32 47 39.3	93 46 10.0	2,786
Swans Ferry, at west side of Red River, at crossing of levee; center of road	32 47 30.3	93 47 16.4	5,746
Telephone line, east side of bayou; center of road at crossing	32 46 40.7	93 49 34.1	12,778
Belcher station, 40 feet south of, 47 feet east of main track of railroad, in southeast corner of station yard; iron post stamped "Prim. Trav. Sta. No. 3, 1915"	32 45 10.8	93 50 02.1	9,391

KEITHVILLE QUADRANGLE.

Along highways near northwest corner of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Lanes east and west, center of main road at	32 29 56.3	93 58 13.5	.....
Greenwood, 3 miles north of, T road north, 15 feet south of, intersection; iron post stamped "Prim. Trav. Sta. No. 7, 1915"	32 29 12.7	93 58 13.0	4,405
T road east, center of intersection of	32 28 38.7	93 58 42.8	4,282
T road west, center of intersection of	32 28 18.8	93 58 52.2	2,168
Cross Creek, center of wooden bridge over	32 28 07.9	93 58 55.9	1,148
Greenwood, 600 feet east of station, in concrete abutment; C. & G. S. bench-mark tablet	32 26 54.9	93 58 18.2	8,316

PLAIN DEALING QUADRANGLE.

Along St. Louis Southwestern Railway and highways near southwest corner of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Crossing of abandoned railroad, center of St. Louis Southwestern track at	32 45 40.2	93 43 17.4	.....
Alden Bridge, about 400 feet northwest of station, in yard of abandoned house, on east-west fence line 90 feet from corner; U.S.C.E. bench-mark post	32 46 26.5	93 43 06.2	4,782
Alden Bridge, 1,000 feet northwest of station, 155 feet southwest of railroad crossing opposite sawmill, in northeast corner of yard of vacant house; iron post stamped "Prim. Trav. Sta. No. 2, 1914"	32 46 32.9	93 43 02.8	704
Alden Bridge, 1 mile northwest of, T roads on east-west road; center of intersection	32 47 25.4	93 43 11.1	5,354
T road north; center of intersection	32 47 24.9	93 44 21.4	6,000
White church, three corners at	32 47 24.4	93 44 50.1	2,448

MISSISSIPPI.

PRIMARY TRAVERSE.

Bovina, Vicksburg, Yokena, and Milliken Bend quadrangles.

WARREN COUNTY.

The following geographic positions were determined by primary traverse and are based on United States Army Corps of Engineers position of courthouse at Vicksburg and bench mark $\frac{102}{9}$ and on United States Geological Survey position of Bovina station and an overhead crossing 3 miles west of same determined in 1902–3, published in Bulletin 216. All positions are on approximate North American datum. This work was done by J. R. Ellis in 1914.

BOVINA QUADRANGLE.

Along highways near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Bovina, 3 miles north and 1 mile west of center of crossroads	32 23 31.3	90 45 00.0	
Bovina, about 2 miles northwest of, opposite front-yard gate at white house; center of road	32 22 27.2	90 44 26.0	7,099
Bovina, 0.80 mile north of, in forks of road near center of triangle; iron bench-mark post stamped "Prim. Trav. Sta. No. 5, 1914"	32 21 44.0	90 43 44.7	5,628
Bovina station, center of track opposite	32 21 06.0	90 44 04.0	4,179

VICKSBURG QUADRANGLE.

Along highways near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Redwood, 15 feet north and 15 feet west of center of crossroads, at southeast corner of blacksmith shop; iron bench mark post stamped "Prim. Trav. Sta. No. 4, 1914"	32 28 40.0	90 48 20.6	
Redwood, about 1 mile east of, center of bridge over Skilleteliah Creek, near old sawmill	32 28 31.7	90 47 18.6	5,381
Redwood, 1 mile south and 1½ miles east of, forks of road, about 40 feet south to hackberry tree	32 27 52.3	90 46 50.8	4,639
Redwood, 2 miles south and 1.6 miles east of, dim road to northeast	32 26 56.5	90 46 41.6	5,703
Villa Nova post office, center of T road northeast, 25 feet southeast to guide board	32 26 02.2	90 46 36.0	5,511
Villa Nova post office, about 0.8 mile southwest of, just south of old church, center of forks of road	32 25 23.4	90 46 50.2	4,101
Villa Nova post office, about 1.4 miles southwest of, at forks of road at Mr. Tucker's residence, 30 feet north to "V" point in angle of forks	32 24 50.8	90 46 54.2	3,317
Villa Nova post office, 1¾ miles south and 1¼ miles east of, center of T road south, 10 feet west to center of △	32 24 30.1	90 45 20.4	8,305
Newman triangulation station, 1.50 miles west of, overhead road crossing of Alabama & Vicksburg R. R	32 20 14.4	90 40 35.6	
Overhead road crossing Alabama & Vicksburg R. R., center of	32 20 12.7	90 47 18.1	1,511
Forks of road, center of small bridge at	32 19 05.5	90 46 53.8	7,106
T road north, center of	32 18 18.0	90 46 58.8	4,824
T road east in cut	32 18 14.8	90 48 09.6	6,084
T road west, center of	32 17 33.5	90 47 55.0	4,357
Forks of road, center of triangle at	32 16 51.8	90 47 50.6	4,237

VICKSBURG QUADRANGLE—Continued.

Along highways near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Asbury Church, about 1.5 miles north of, center of forks of road	32 16 13.7	90 48 50.5	6,425
Asbury Church, 0.50 mile north of, 10 feet north and 10 feet east of center of T road west; iron bench mark post stamped "Prim. Trav. Sta. No. 2, 1914"	32 15 12.0	90 48 37.7	6,337
T. 15 N., R. 6 W., corner secs. 20, 21, 28, and 29; iron gas pipe	32 15 02.4	90 49 24.5	4,139
Antioch Church, 1 mile northeast of, T road north	32 15 08.7	90 49 58.3	2,973
Grange Hall, forks of road at guide post on south side of triangle	32 15 25.8	90 52 18.0	.....
Intersection of Vicksburg, Fishers Ferry, and Warrenton roads, center of triangle at T road north	32 15 34.3	90 53 07.6	4,338
Mail box 30, center of T road south at	32 15 25.6	90 53 42.1	3,094
Cedar station, east and west road crossing at	32 15 20.5	90 55 30.9	.....

From Vicksburg to Redwood along Yazoo & Mississippi Valley Railroad.

Milepost 229, just south of; road crossing east and west	32 16 18.7	90 55 11.9	6,102
Milepost 230, 0.5 mile south of, road crossing	32 16 49.9	90 55 03.1	3,240
Stout station, road crossing at	32 18 01.7	90 53 56.3	9,243
Trestle No. L 222–77, creek southwest	32 18 41.2	90 53 41.2	4,199
Water works, overhead crossing near	32 19 22.6	90 53 41.4	4,179
Overhead crossing of Queen & Crescent Route R. R. at Yazoo & Mississippi Valley R. R.	32 20 07.0	90 53 27.9	4,636
Vicksburg, cupola of Warren County courthouse, U. S. Corps of Engineers triangulation point	32 21 07.21	90 52 42.66	7,212
Vicksburg station, 1 mile north of, road crossing	32 21 54.6	90 52 31.1	4,887
Vicksburg station, 2 miles north of, 25 feet north of wagon road, 20 feet west of railroad track, at Anderson & Tully Co.'s mill; iron bench mark post stamped "Prim. Trav. Sta. No. 3, 1914"	32 22 50.8	90 52 04.1	6,142
Vicksburg, 3 miles north of, private road crossing	32 23 29.6	90 51 36.6	4,568
Kings station (signal post office), road crossing at	32 24 03.1	90 51 12.7	3,956
Kings station, 1.25 miles northeast of, private road crossing at section house	32 24 50.6	90 50 21.2	6,519
Milepost 241, 660 feet north of, private road crossing	32 25 29.0	90 49 39.4	5,279
Blakely station, 0.60 mile southwest of, private road crossing	32 26 26.0	90 49 14.4	6,147
Blakely station, private road crossing at	32 26 56.8	90 49 07.6	3,159
Blakely station, 1 mile northeast of, road crossing	32 27 48.1	90 48 51.3	5,367

Along highways to point near northwest corner of quadrangle.

Guide posts at forks of road	32 23 12.9	90 52 24.3	.....
Chickasaw Bayou, north end of bridge over, at forks of road	32 24 07.0	90 53 00.1	6,276
Sweets Ferry, 2 miles south and 0.30 mile east of, center of cross roads	32 24 50.3	90 53 15.2	4,557
Sweets Ferry, about 1 mile southwest of, T road northeast	32 25 53.7	90 53 43.8	6,861
Sweets Ferry, 500 feet east of south landing at, and 10 feet north of road, U. S. Corps of Engineers bench mark	32 26 46.7	90 53 32.1	5,451
Sweets Ferry, 220 feet north of north landing at, on north bank of Yazoo River; iron bench-mark post stamped "Prim. Trav. Sta. No. 6, 1914"	32 26 58.9	90 53 39.3	1,378
Sweets Ferry, 1.2 miles southwest of, on south side of road, in north side of elm tree; cross cut	32 26 45.0	90 54 48.5	6,094
Sweets Ferry, about 2 miles west of, 150 feet west of slough, on south side of road, in north face of poplar tree; cross cut	32 27 10.8	90 55 39.7	5,100
Sweets Ferry, about 3 miles west of, on south side of road, just east of turn in road, in north face of large cottonwood tree; cross cut	32 27 06.4	90 56 36.4	4,876
White oak tree, south side of road; cross cut	32 27 08.0	90 57 43.7	5,768
At east end of graded road, 35 feet south and 20 feet east to hickory snag (Issaquena-Warren county line)	32 27 11.2	90 57 52.2	792
West end of gate at south side of timber	32 26 57.8	90 58 24.9	3,118
Holpina Landing, ⅛ mile northwest of Sam Brown's cotton gin at, at forks of road, 25 feet north and 15 feet east of 30-inch pecan tree; iron bench-mark post stamped "Prim. Trav. Sta. No. 7, 1914"	32 27 44.3	90 59 52.9	8,884

Magnetic declination for south border of quadrangle, 5° 57′ E.; east border, 6° 02′ E.; north border, 6° 12′ E.; center, 6° 10′ E.

MILLIKEN BEND QUADRANGLE.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Mississippi River Commission bench mark $\frac{102}{9}$	32 27 57.12	90 01 43.70	9,581

YOKENA QUADRANGLE.

Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Cedars station, 0.5 mile south of, 20 feet north to center of T road north; iron bench-mark post stamped "Prim. Trav. Sta. No. 1, 1914"	32 14 48.6	90 55 35.3	.....
Antioch Church, forks of road at	32 14 46.7	90 50 56.5	.....

Magnetic declination for north border of quadrangle, 5° 57′ E.

Doloroso, McNair, and Natchez quadrangles.

ADAMS AND JEFFERSON COUNTIES.

The following geographic positions, on approximate North American datum, were determined in 1914 by J. R. Ellis. Two circuits were run based on position of Catholic Church spire at Natchez, a Mississippi River Commission triangulation station.

DOLOROSO QUADRANGLE.

Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Road forks, center of	31 29 42.8	91 21 37.1	.....
Natchez, about 6 miles southeast of; 20 feet north and 20 feet east of center of forks, on east side of the Natchez-Kinston road near second-class road east at Alexander Turner's mail box; iron post stamped "Prim. Trav. Sta. No. 9, 1914"	31 29 19.7	91 21 57.0	2,905

Magnetic declination near north border of quadrangle, 6° 21′ E.

McNAIR QUADRANGLE.

Along highways near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T road west, center of	31 42 09.1	91 14 59.4	.....
Church Hill post office, 40 feet north and 15 feet west of center of forks, at north end of old store; iron post stamped "Prim. Trav. Sta. No. 12, 1914"	31 42 56.9	91 14 17.0	6,054
Church Hill post office, about 1.5 miles southeast of, at old building; center of T road southwest	31 41 43.9	91 13 39.4	8,054
Church Hill post office, about 2 miles southeast of; T road east	31 41 20.0	91 13 23.1	2,796
Church Hill post office, about 3 miles southeast of; center of road at driveway to white frame church	31 40 43.4	91 14 00.4	4,906
Stanton, 2.9 miles northeast of; center of forks	31 39 24.2	91 13 44.8	8,122
Stanton, 1.1 miles northeast of; Jefferson-Adams county line; wagon axle on west side of road	31 37 51.9	91 14 05.4	9,492
Stanton, 0.87 mile northeast of; fork in road, at center of grass triangle	31 37 40.0	91 14 08.0	1,224
Stanton station, 35 feet north and 35 feet west of private road crossing at; and at northeast corner of J. N. Carpenter's barn; iron post stamped "Prim. Trav. Sta. No. 13, 1914"	31 36 56.7	91 14 24.2	4,597

Magnetic declination for west border of quadrangle, 6° 28′ E.

NATCHEZ QUADRANGLE.

Along Yazoo & Mississippi Valley Railroad.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Natchez, Catholic Church spire, cross on	31 33 30.5	91 24 04.25	
Natchez, 0.9 mile east of; road crossing east of Standard Oil Co.'s plant	31 33 28.6	91 23 08.4	4,836
Mississippi Packing Plant, north-south road crossing at	31 33 55.4	91 22 13.7	5,450
Mississippi Packing Plant, 1.2 miles northeast of; about 0.6 mile north of M. P. 95 J.; private road crossing	31 34 49.8	91 21 34.2	6,470
Private road crossing	31 35 26.8	91 21 07.4	4,398
M. P. 93 J., 0.25 mile east of; road crossing	31 35 47.5	91 20 25.8	4,167
Foster station, north-south road crossing at	31 36 03.3	91 19 43.8	3,961
M. P. J. 91, 530 feet east of; trestle over creek south	31 36 14.4	91 18 39.0	5,710
M. P. J. 90, 305 feet east of; bridge over branch south	31 36 09.9	91 17 41.8	4,970
Selma station, road crossing at	31 36 03.6	91 16 42.8	5,141
Selma station, 1.2 miles northeast of; 0.23 mile east of M. P. J. 88; private road crossing	31 36 23.8	91 15 33.9	6,299

Along highways.

Selma station, 1.30 miles south of; T road east	31 34 59.6	91 17 06.1	11,662
Washington, center of road forks at; 30 feet north to china berry tree	31 34 44.2	91 17 52.9	4,333
Washington, 0.4 mile south of; road southwest to poor farm	31 34 23.0	91 17 52.5	2,149
Washington, 0.85 mile south of; center of steel bridge over creek west	31 34 02.3	91 18 04.4	2,333
Washington, 1.8 miles southeast of, and about 0.7 mile east of Washington station; road crossing Mississippi Central R. R.	31 33 16.5	91 17 45.1	4,918
Washington, about 3.10 miles southeast of; center of forks	31 32 33.1	91 16 46.9	6,676
Washington, about 4 miles south of; road north; 10 feet west to sumac sapling	31 31 49.5	91 17 05.0	4,677
Jeannette, about 3 miles northwest of, and about 1 mile east of Zion Watch Church, in triangle at road fork; iron post stamped "Prim. Trav. Sta. No. 8, 1914"	31 30 36.8	91 16 56.3	7,385
Zion Watch Church, center of cross roads at	31 30 45.4	91 17 43.7	4,195
Zion Watch Church, 1.2 miles northwest of; T road south	31 30 56.8	91 18 54.8	6,263
Zion Watch Church, 1.8 miles northwest of; fork in road just north of gate	31 30 29.8	91 19 19.8	3,476
Highland Negro Church, 0.25 mile northeast of; center of triangle at fork in roads	31 30 12.1	91 20 19.1	5,442
St. Catherines Creek bridge, 1.60 miles southe ast of; road south	31 30 03.2	91 22 12.5	
St. Catherines Creek, just southeast of steel bridge over; 15 feet north of west end of small bridge; T road south	31 30 59.9	91 23 27.1	8,626
MississippiCentral R. R. crossing of Natchez; Kingston road under T road east, center of	31 32 25.3	91 23 47.2	8,807
	31 35 02.9	91 21 59.1	
Jenkins's store, 150 feet south of; 20 feet southwest of south end of grass triangle at fork in road	31 36 07.0	91 21 57.4	6,477
Jenkins's store, 1.3 miles north of; T road west	31 37 13.1	91 21 53.6	6,692
Pine Ridge schoolhouse, in northwest corner of grounds of; iron post stamped "Prim. Trav. Sta. No. 10, 1914"	31 37 48.5	91 20 53.2	6,331
Pine Ridge schoolhouse, 1.1 miles northeast of; 20 feet north and 35 feet east of northeast corner of store porch; forks	31 38 44.0	91 20 39.5	5,730
Pine Ridge schoolhouse, 2 miles north of center of gate	31 39 07.9	91 21 29.1	4,918
Jenkins's plantation, 0.3 mile north of residence; T road west	31 40 31.8	91 22 13.2	9,293
Anna post office, south side of crossroads at; iron post stamped "Prim. Trav. Sta. No. 11, 1914"	31 41 48.8	91 21 06.2	9,706
Anna post office, about 1 mile southeast of; dim road southwest	31 41 14.1	91 20 22.3	5,162
Anna post office, about 1.85 miles southeast of; 30 feet north and 20 feet east of mail box near schoolhouse; crossroads	31 40 50.9	91 19 38.3	4,470
Anna post office, about 2.85 miles southeast of; center of triangle of road just south of gate	31 41 33.5	91 19 04.0	5,227
Fairchild Creek, southeast corner of approach to south end of bridge over	31 41 28.9	91 17 30.3	8,114
Mr. Minjee's residence, 0.25 mile southeast of; 45 feet north of small bridge; forks of road	31 41 17.9	91 15 48.8	8,840

Magnetic declination for north part of north half of quadrangle, 6° 24′ E.; for center, north and south, 6° 19′ E.; for east border, 6° 28′ E.; for south border, 6° 21′ E.

MAINE.

PRIMARY TRAVERSE.

Portland quadrangle.

CUMBERLAND COUNTY.

The following geographic positions were determined in 1914 by R. C. Seitz. The line starts from Orthodox Church, United States Coast and Geodetic Survey triangulation point, in Saco, follows highways northward near west border of quadrangle, and is tied to United States Geological Survey triangulation station Gorham, described in Bulletin 122.

PORTLAND QUADRANGLE.

Along highways near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Saco Orthodox Church spire (Coast and Geodetic Survey triangulation point)	43 30 02.95	70 26 35.05	
Saco railway station, North Street crossing Boston & Maine R. R.	43 30 28.5	70 26 54.5	2,960
Jenkin, road forks northeast	43 31 30.4	70 27 46.8	7,350
Saco station, 3.2 miles northwest of, about 200 feet west of T roads, north of road, west end of stone arch under highway; tablet stamped "Me. 134, 1914, S., Prim. Trav. Sta. No. 1"	43 32 41.5	70 29 11.3	9,520
Junction of Heath road with Saco road	43 33 18.4	70 29 48.1	4,613
Heath meeting house, crossroads at	43 34 11.4	70 28 52.0	6,770
Forks of Buxton road with Heath road	43 34 42.7	70 28 25.0	3,750
Heath meeting house, 0.75 mile north of, about 1,000 feet west of road forks, in north end of stone arch; tablet stamped "Me. 93, 1914, S., Prim. Trav. Sta. No. 2"	43 34 48.7	70 28 36.1	1,014
Crossroads, Buxton road with Westbrook road	43 35 21.2	70 29 11.6	4,210
Cumberland-York county line, road forks northwest on	43 35 56.3	70 28 34.2	4,497
Dunston, 5 miles northwest of, Buxton station, 3.5 miles southeast of; stone property corner in southeast angle of crossroads; tablet stamped "Me. 147, 1914, S., Prim. Trav. Sta. No. 3"	43 36 29.8	70 27 40.0	5,240
South Buxton, four corners in front of store	43 37 15.4	70 28 46.5	6,722
Buxton road, Gorham road, intersection of (Buxton quadrangle)	43 37 57.2	70 30 15.5	7,790
Gorham, 3.6 miles south of, west end small drain under railway at south side of highway; tablet stamped "Me. 181, 1914, S., Prim. Trav. Sta. No. 4"	43 38 35.9	70 29 37.9	4,800
York-Cumberland county line, road crossing	43 39 19.3	70 28 28.1	6,763
Milepost "W 135 P. 12"	43 39 49.6	70 27 46.8	4,315
Gorham Normal School, spire of, by U. S. Geological Survey triangulation, 1888	43 40 50.60	70 26 49.96	7,460

Magnetic declination for west border of quadrangle, 15° 14′ W.

VERMONT.

TRIANGULATION STATIONS.

Rochester quadrangle.

ADDISON, RUTLAND AND WINDSOR COUNTIES.

In 1915 D. H. Baldwin located several secondary points for control of the Rochester 15-minute quadrangle based on Goshen and Killington stations of United States Coast and Geodetic Survey, North American datum.

Seven stations were occupied and seven points were located by intersections. No least-square figure adjustment was made.

AUSTIN HILL, WINDSOR COUNTY, VT. (Not occupied.)

On bare south part of summit of Austin Hill, about 2 miles west of the village of Rochester.

Signal: Temporary signal pole.

Station mark: No mark established.

[Latitude 43° 52′ 14.40″. Longitude 72° 49′ 40.29″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log meters.*	*Miles.*
Jones	88 54 39	268 50 49	3.87001	4.606
Cushman barn	246 27 41	66 30 25	3.76127	3.586
Rochester	273 37 26	... .	3.80471	3.963

BRAINTREE GAP, VT. (Not occupied.)

On the summit of a mountain south of Braintree Gap, probably in Addison County, near corner of Orange and Windsor counties.

Signal: A signal pole set in the top of a tall pine tree.

Station mark: Tall pine tree.

[Latitude 43° 57′ 56.48″. Longitude 72° 47′ 42.90″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log meters.*	*Miles.*
Rochester	341 08 17	161 10 13	4.06390	7.200
Hancock tunnel	37 56 18	217 53 08	3.99770	6.181
Braintree road	112 18 36	292 17 50	3.20570	9.978

BRAINTREE ROAD, ADDISON COUNTY, VT.

Just a few hundred feet north of the junction of the main road with a road northeast to Braintree Gap and about 2 miles east of Granville village. It is about 50 feet northwest of north fence line of the Gap road and about 800 feet (true azimuth 93°) to the chimney on the house on the opposite side of main road.

Signal: A temporary flagpole 3 feet southwest of the signal.

Station mark: A small drill hole in small surface rock outcrop.

Reference mark: A shallow drill hole in the top of a large rock on the northeast side of a springlike basin in water course through field; distant 156.2 feet, true azimuth 195° 06.4′ from station.

[Latitude 43° 58′ 16.25″. Longitude 72° 48′ 49.54″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Little Wilcox	4 12 59	... .	4.22706	10.481
Hancock tunnel	28 41 38	208 39 14	3.98410	5.990
Philadelphia	36 41 24	... .	3.99255	6.108
Gillespie	71 38 49	... .	3.72462	3.296
Granville	114 20 46	294 16 15	3.97940	5.926
Braintree Gap	292 17 50	112 18 36	3.20570	9.978
Rochester	335 38 48	155 42 37	4.10380	7.891

CUSHMAN BARN, WINDSOR COUNTY, VT.

On Cushman range east of the village of Rochester, on the south bare slope of wooded knob and about 0.6 mile northwest of gap crossed by road from Rochester to West Randolph. In plain view from Rochester.

Station mark: The southwest corner of an old barn, 45.5 feet long by 25.5 feet wide.

Reference mark: A drill hole in surface outcrop, 581.8 feet distant, 337° 52.9′ true azimuth from station, from which points to the northwest may be seen.

[Latitude 43° 53′ 29.02″. Longitude 72° 45′ 43.24″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Killington	8 27 25	188 24 59	4.50763	19.998
Wilcox	28 13 37	... .	----------	----------
Mount Carmel	44 30 46	224 24 10	4.26096	11.332
Austin	66 30 25	246 27 41	3.76127	3.586
Rochester postmaster's house	65 39 30	245 37 40	3.58942	2.414
Goshen	67 53 44	247 45 02	4.25947	11.293
Jones	79 08 50	259 02 16	4.11179	8.038
Hancock tunnel	92 41 14	272 36 41	3.94431	5.466
Philadelphia	95 37 47	... .	4.00353	6.264
Gillespie	128 04 52	308 00 06	4.06712	7.252
Granville	134 49 25	134 56 05	4.25850	11.268
Rochester	338 23 15	158 23 48	3.46460	1.811

GILLESPIE, ADDISON COUNTY, VT. (Not occupied.)

Just west of the village of Granville, on the summit of a timbered mountain by that name.

Signal: Flagpole in the top of a balsam fir tree.

Station mark: Flagpole in the top of a balsam fir tree.

Reference mark: Blazed base of tree, 3 feet south by 3 feet west of point below flagpole.

[Latitude 43° 57′ 22.05″. Longitude 72° 52′ 35.27″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Braintree road	251 36 18	... .	3.72461	3.296
Cushman barn	308 00 06	128 04 52	4.06712	7.252
Rochester	313 53 52	... .	4.15422	8.862
Rochester postmaster's house	327 13 53	147 16 49	4.01939	6.497
Hancock tunnel	356 32 42	176 32 55	3.83238	4.224

GOSHEN, ADDISON COUNTY, VT. (Not occupied in 1915.)

Coast and Geodetic Survey, 1880–1885.

On the Green Mountains, in the southeast part of the town of Goshen and about 1.5 miles to the southwest of (Goshen Gap) summit of highway leading from Brandon to Rochester. The mountain is wooded.

Station mark: An iron bolt in rock.

Signal: Target and flag in pine tree; distant 12.5 feet true azimuth 27° from station.

[Latitude 43° 49′ 46.72″. Longitude 72° 58′ 16.87″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Jones	223 03 04	43 05 12	3.78107	3.753
Hancock tunnel	227 51 15	47 55 10	4.03509	6.736
Cushman barn	247 45 02	67 53 44	4.25947	11.293
Rochester	256 52 23	77 01 38	4.26438	11.422
Killington (C. & G. S.)	334 00 45	154 07 00	4.4436010	17.256
Herrick (C. & G. S.)	... .	... .	4.4970290	19.515

GRANVILLE, ADDISON COUNTY, VT. (Not occupied.)

The tallest tree on obtuse-angled summit of ridge in west extremity of town of Granville.

[Latitude 44° 00′ 23.46″. Longitude 72° 55′ 19.56″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Braintree road	294 16 15	114 20 46	3.97940	5.926
Cushman barn	314 49 25	134 56 05	4.25850	11.268
Hancock tunnel	341 46 39	161 48 46	4.11520	8.100

HANCOCK TUNNEL, ADDISON COUNTY, VT.

Reached from Rochester via road to Robinson Mill, thence north to the summit of the gap by that name. It is on the west side of the gap, on a grassy slope.

Signal: A temporary flagpole well braced.

Station mark: A temporary flagpole well braced.

Reference mark: A drill hole in rock 142.7 feet distant, true azimuth 150° 26′ and about 50 feet north of indefinite center of ridge.

[Latitude 43° 53′ 42.19″. Longitude 72° 52′ 16.93″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Mount Carmel	16 31 43	... .	4.14627	8.702
Goshen	47 55 10	... .	4.03509	6.735
Jones	153 54 25	... .	3.68515	3.010
Granville	161 48 46	341 46 39	4.11520	8.101
Gillespie	176 32 55	356 32 42	3.83238	4.224
Braintree road	208 39 14	28 41 38	3 98410	5.990
Braintree Gap	217 53 08	37 56 18	3.99770	6.181
Cushman barn	272 36 41	92 41 14	3.94431	5.446
Little Wilcox	337 54 40	.....	3.95549	5.608

JONES MOUNTAIN, WINDSOR COUNTY, VT.

On grassy summit northwest of Little Pike Mountain, surrounded by taller mountains. It is about 800 feet uphill from Green's house, north of J. Smith's house. True azimuth to Green's chimney, 26° 04′.

Signal and station mark: A flagpole.

Reference mark: A drill hole in small surface rock; 38.7 feet distant, true azimuth 156° 44′.

[Latitude 43° 52′ 09.70″. Longitude 72° 55′ 12.20″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Goshen	43 05 12	223 03 04	3.78107	3.753
Hancock	233 52 24	53 54 26	3.68515	3.010
Cushman barn	259 02 16	79 08 50	4.11179	8.038
Austin	268 50 49	88 54 39	3.87001	4.606
Rochester	271 01 31	91 08 39	4.13930	8.564

LITTLE WILCOX, RUTLAND COUNTY, VT. (Not occupied.)

Summit of mountain.

Signal and station mark: Highest tree top.

[Latitude 43° 49′ 11.20″. Longitude 72° 49′ 45.04″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Hancock		337 54 40	3.95549	5.609
Braintree road		4 12 59	4.22706	10.487
Killington		178 19 41	4.37818	14.843

MOUNT CARMEL, RUTLAND COUNTY, VT. (Not occupied.)

A rounded conical summit in Green Mountain Range.

Station mark: Pole on rough tower, erected by fire warden, in center of summit.

[Latitude 43° 46′ 27.24″. Longitude 72° 55′ 14.94″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Hancock tunnel	196 30 33	... .	4.14641	8.701
Cushman barn	224 24 10	44 30 46	4.26096	11.332
Killington	336 44 04	156 48 13	4.31129	12.724

PHILADELPHIA, ADDISON COUNTY, VT. (Not occupied.)

On the north part of summit level of Philadelphia Mountain, about 2 miles northwest of Hancock tunnel.

Station mark: A tall dead tree in a burning.

[Latitude 43° 54′ 00.78″. Longitude 72° 53′ 12.76″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Braintree road		36 41 24	3.99255	6.108
Cushman barn		95 37 47	4.00353	6.264
Rochester		108 25 28	4.06841	7.274

ROCHESTER, WINDSOR COUNTY, VT.

On a mountain on the east boundary of the town of Rochester and about 0.8 mile south of the summit of the highway leading from West Randolph to Rochester Village. The mountain is timbered, but several sights were cut. The United States Coast and Geodetic Survey bolt could not be found.

Station mark: A bronze tablet in surface outcrop in the center of an area in which old signal boards were found and at about the highest point of the mountain.

Signal: Flagpole in tree 18.5 feet distant; true azimuth 3° from station.

[Latitude 43° 52′ 01.22″. Longitude 72° 44′ 55.17,″ U. S. C. & G. S station. Latitude 43° 52′ 01.31″; longitude 72° 44′ 55.15″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Killington	11 17 07	... .	4.47271	18.453
Goshen	77 01 38	... .	4.26438	11.422
Austin	93 40 43	... .	3.80471	3.963
Jones	91 08 39	271 01 31	4.13930	8.563
Gillespie	134 00 19	... .	4.15424	8.863
Braintree road	155 42 37	335 38 48	3.99255	6.108
Cushman barn	158 23 48	338 23 15	3.46460	1.811
Braintree Gap	161 10 13	341 08 17	4.06390	7.198

ROCHESTER, POSTMASTER'S HOUSE, WINDSOR COUNTY, VT.

On bluff back of Rochester Inn, overlooking town

Station mark: Center of chimney.

[Latitude 43° 52′ 37.10″. Longitude 72° 48′ 21.78″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Gillespie	147 16 49	327 13 53	4.01939	6.497
Cushman	245 37 40	65 39 30	3.58942	2.414

MARYLAND AND THE DISTRICT OF COLUMBIA.

PRIMARY TRAVERSE.

Washington quadrangle (embracing portions of Laurel, Rockville, East Washington, and West Washington quadrangles).

DISTRICT OF COLUMBIA; MONTGOMERY AND PRINCE GEORGES COUNTIES, MD.

The following geographic positions were determined by C. B. Kendall in 1903, 1904, 1912, and 1915, and by J. R. Ellis in 1910 and 1912.

The work of 1904, 1910, and 1912, published in Bulletins 245, 276, 496, and 551, has been readjusted to agree with lines run in 1915 by C. B. Kendall and tied to Soper, Cissel, north and east corners of the District of Columbia, Beal, Maryland Agricultural College, Stabler, and Rockville triangulation stations of the United States Coast and Geodetic Survey.

WASHINGTON QUADRANGLE.

MARYLAND.

Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Soper triangulation station, 6 miles northwest of Beltsville, on land of Bank. Downes, about 92 feet east of old Columbia turnpike, Washington to Baltimore; station mark earthen cone 2 feet below surface. Reference marks: No. 1, copper nail and washer in apple tree, 53.9 feet east; No. 2, copper nail and washer in cedar tree, 61 feet south; No. 3, copper nail and washer in cedar tree, 79.4 feet west; No. 4, copper nail and washer in apple tree, 65.8 feet west	39 05 11.84	76 57 00.72	
Three corners, 5 feet to corner rail fence, 20 feet south to post	39 05 03.4	76 57 04.7	911
Fairland, center of public crossroads at	39 04 33.6	76 57 28.8	3,562
Fairland, in west face of south corner of stone foundation of old Soper dwelling, in northeast corner of crossroads, 120 feet north of center of crossroads; aluminum tablet stamped "Prim. Trav. Sta. No. 2, Maryland, 414, 1912"	39 04 34.7	76 57 28.9	115
Paint Branch, center of wooden bridge over	39 04 38.2	76 58 35.4	5,261
T road north, 25 feet northwest to mail box, 18 feet northeast to corner of wire fence	39 04 40.6	76 59 12.3	2,921
Colesville, in south wall of foundation of F. M. Hobb's residence, which is in northeast corner of crossroads; aluminum tablet stamped "Prim. Trav. Sta. No. 3, 1912"	39 04 33.2	77 00 07.1	4,382
Colesville, about 0.3 mile southwest of, 700 feet south of cemetery, 500 feet south of public road; center of white house	39 04 21.7	77 00 26.3	1,913
Colesville, about 1.1 miles southwest of, 300 feet south of road; house	39 03 55.4	77 01 16.8	4,789
Three corners, 500 feet south of the northwest mill, 100 feet southwest of iron bridge over northwest branch, 10 feet north to Bliss and Sommers's mail box, 35 feet southwest to center of plank bridge; public T road south	39 03 52.2	77 01 44.0	2,163
Second-class road north, at bend of main road to southwest, 25 feet north to gate, 18 feet west to maple tree	39 03 53.4	77 02 23.6	3,127
Glenmont, intersection of Union pike and public road northeast to Colesville, 40 feet northeast to corner wire fence post, 35 feet southeast to telephone pole, 35 feet southwest to telephone pole No. 110	39 03 28.8	77 03 01.0	3,868
Three corners, public T road east, center of Union pike at	39 03 10.6	77 03 04.6	1,857
Wheaton, on south side of store kept by J. C. Cissel; aluminum tablet stamped "Prim. Trav. Sta. No. 1, 1915, elev. 459"	39 02 29.6	77 03 06.5	4,154
Wheaton, 0.25 mile southwest of; public road crossing	39 02 24.0	77 03 20.7	1,257
Kensington, forks at north edge of, pike north and public road northeast, 20 feet south to large elm	39 02 00.5	77 04 11.1	4,632
Kensington, intersection of St. Paul Street and Baltimore & Ohio R. R., 250 feet west of station; center between tracks	39 01 38.1	77 04 22.2	2,429

WASHINGTON QUADRANGLE—Continued.

Along Baltimore & Ohio R. R. from Kensington to Rockville.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Kensington, about 1 mile northwest of; center of east track under highway bridge	39 02 03.1	77 05 16.5	4,974
Garrett Park station, 100 feet south of; public road crossing	39 02 19.1	77 05 36.5	2,258
Windham station, 40 feet southeast of; center of west track at road crossing	39 02 53.2	77 06 16.0	4,650
Randolph station, 100 feet northwest of; center of west track at road crossing	39 03 11.8	77 06 37.5	2,540
Halpine station, 80 feet southeast of; center of main track at road crossing	39 03 47.1	77 07 18.4	4,810
Halpine station, about 1,500 feet northwest of; center of west track under public road crossing	39 03 58.1	77 07 31.0	1,493
Autrey Park station, about 1,500 feet northwest of; center of west track under road crossing	39 04 28.8	77 08 06.6	4,189
Rockville; flagpole on top of standpipe	39 04 56.0	77 08 26.4	3,159
Rockville station, 200 feet southeast of; center of west main track at street crossing	39 04 57.6	77 08 39.8	1,077
Rockville, center of street-car track, at intersection of Montgomery Avenue and Adams Street	39 05 02.8	77 09 18.3	3,079
Rockville latitude station, about 1 mile from Rockville railroad station, on Forest Avenue, Rockville, on land of Edwin Smith; the pier is built of rough sandstone and cement on foundation of quartz rock; pier is 0.61 meter square and the top is 0.99 meter above ground	39 05 11.21	77 09 36.65	1,679
Rockville, about 1 mile southwest of; center of pike at public road southeast, 20 feet north to small cedar, 30 feet west to small cedar	39 04 24.1	77 09 54.4	4,968
Three corners, second-class T road west, center of pike at, 30 feet northwest to telephone pole 72, 35 feet west to wire gate	39 03 51.7	77 10 33.1	4,486
Forks, center of pike at second-class road east, 30 feet east to cedar tree, 15 feet southeast to fence post	39 03 24.1	77 10 45.5	2,963
Rockville, 3.9 miles southwest of, at road forks east, in west face of stone under the southwest corner of the Wayside schoolhouse; aluminum tablet stamped "Prim. Trav. Sta. No. 2, 1915, elev. 420"	39 03 00.3	77 11 17.8	3,511
Three corners at foot of hill, center of pike at public T road east, 30 feet southeast to mail box, 40 feet southwest to sycamore stump	39 02 08.0	77 11 40.7	5,586
Potomac, about 0.6 mile north of; 200 feet east of church, center of pike at public T road east, 15 feet south to corner fence, 30 feet northeast to culvert	39 01 33.9	77 12 19.0	4,592
Potomac, four corners at, 45 feet northeast to southwest corner of John Stone's store, 65 feet north to southeast corner of Perry's store, 25 feet west to corner of iron fence	39 01 05.0	77 12 33.1	3,138
Potomac, 0.9 mile northwest of; public T road southwest, 20 feet west to corner fence, 30 feet southeast to corner fence	39 01 36.8	77 13 13.6	4,535
Grimes Lock, about 0.3 mile north of; public T road south to lock, 20 feet southwest to mail box, 12 feet north to wire fence	39 02 06.3	77 14 26.3	6,471
Grimes Lock (No. 21), cemented in coping stone of west wing wall to south end of; aluminum tablet stamped "Prim. Trav. Sta. No. 179"	39 01 51.96	77 14 36.82	1,673

Along highways near north corner of District of Columbia.

Linden, 1,000 feet south of; center of bridge over Baltimore & Ohio R. R.	39 00 19.7	77 03 00.3	.....
Cissel triangulation station of U. S. Coast and Geodetic Survey, on land of Mr. Cissel on north railroad bank and 600 yards southeast of the house; station mark, an earthenware ale bottle 3 feet underground and granite block 2 feet long and 6 by 6 inches at top with ¼-inch hole in center	39 00 06.3	77 02 39.6	2,120
North corner of District of Columbia, on northwest side of hill, on land of Mr. Fenwick. It can be reached by taking Silver Spring road and after passing toll gate by taking left-hand road to Mr. Fenwick's house. Station mark: A 12 by 12 inch stone standing 2 feet out of ground and in good state of preservation	38 59 45.38	77 02 28.48	2,300

Along highways near Maryland Agricultural College.

Lakeland, 50 feet southeast of store, at public road crossing, center of west track	38 59 20.2	76 55 44.5	.....
College Avenue station, at public east and west road leading to Maryland Agricultural College, center of (west) track of electric line	38 58 50.8	76 55 55.5	3,102
Maryland Agricultural College triangulation station, center of cupola at south end of old barracks building (destroyed by fire)	38 59 00.88	76 56 37.88	3,500

WASHINGTON QUADRANGLE—Continued.

Along highways near Maryland Agricultural College—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Maryland Agricultural College, center of standpipe at	38 59 04.0	76 56 41.3	411
Three corners, public T road south, 25 feet east to small cedar, 10 feet southwest to corner post of wire fence (location doubtful)	38 59 05.1	76 56 57.1	1,256
Beals triangulation station, about 1 mile southwest of the Maryland Agricultural College, center of cupola on red brick house, the old residence of Gen. Beal	38 58 42.67	76 57 33.84	3,684
East corner of the District of Columbia, in bottom on east side of stream near Mr. Lee's house; 12 by 12 inch stone 2 feet out of ground, in good state of preservation	38 53 34.23	76 54 33.94	.....

Magnetic declination, 1915: Near north border, on line from Soper triangulation station to Kensington, mean declination is 5° 03′ W., range 3° 55′ W. to 7° 02′ W.; near north corner of District of Columbia mean declination is 4° 54′ W.; near Maryland Agricultural College mean declination is 4° 29′ W., range 1° 35′ E. to 6° 45′ W.; along railroad, Kensington to Rockville, mean declination is 7° 07′ W.; along highways, from Rockville to Grimes Lock, mean declination is 6° 02′ W., range 3° 00′ W. to 8° 19′ W.

The following 37 geographic positions were determined by J. R. Ellis during the season of 1910 and are based on Coast and Geodetic Survey triangulation stations.

WASHINGTON QUADRANGLE AND VICINITY.

Along the Chesapeake & Ohio Canal between Georgetown, D. C., and Great Falls, Md.

Station.	Latitude.	Longitude.
DISTRICT OF COLUMBIA.		
	° ′ ″	° ′ ″
Georgetown College, east lightning rod	38 54 26.13	77 04 22.70
Georgetown College Observatory dome	38 54 29.94	77 04 39.05
Chain Bridge, flagpole on hotel at west end of	38 55 47.95	77 07 02.85
Station 252	38 55 51.01	77 06 46.63
District line monument No. 4	38 56 15.28	77 06 57.38
MARYLAND.		
Lock No. 7, cross cut on south end of east wall	38 57 51.80	77 08 20.81
Lock No. 8, south hinge of lower wing	38 58 15.00	77 09 39.10
Lock No. 8, bronze tablet in top of wall, east end, north side; stamped "Prim. Trav. Sta. No. 3, 1910, elev. 69"	38 58 15.27	77 09 38.84
Lock No. 9, cross in center of painted traingle on south part of top of east wall; painted "elev. 77"	38 58 20.04	77 10 00.92
Lock No. 10, cross in center of painted triangle on south part of top of east wall; painted "elev. 85"	38 58 20.13	77 10 06.74
Lock No. 11, cross cut on top of stone wall; elevation 93 feet	38 58 20.31	77 10 18.89
Milestone No. 9	38 58 20.25	77 10 10.88
Lock No. 12, on top of southeast corner of wall; center of cross cut; elevation 102 feet	38 58 20.75	77 10 39.63
Lock No. 12, south end of west gate	38 58 20.66	77 10 41.20
Lock No. 13, on top of southeast wall; center of square cut; elevation 109 feet	38 58 20.08	77 10 45.20
Lock No. 14, in top of east part of wall, at lower gate; bronze tablet; elevation stamped "117"	38 58 19.80	77 10 50.85
Lock No. 14, south hinge to west gate	38 58 19.39	77 10 52.23
Lock No. 14, spillway about 1,000 feet west of; towpath	38 58 17.82	77 11 04.81
Milestone No. 10, hole drilled in center of paint ring on top of	38 58 15.21	77 11 27.38
Copper nail and washer in notch in root of water oak on south side of towpath; elevation 120 feet	38 58 16.79	77 11 44.02
Crossing of road through culvert under towpath	38 58 23.03	77 11 56.30
Milestone 11, painted point on highest part; elevation 119 feet	38 58 38.74	77 12 25.06
Towpath over branch	38 58 38.38	77 13 15.72
Milestone 12	38 58 42.42	77 13 26.76
Triangle (△) on ledge on west side of towpath, painted "118" 650 feet above rock crusher	38 58 57.06	77 13 52.23

WASHINGTON QUADRANGLE AND VICINITY—Continued.

Along the Chesapeake & Ohio Canal between Georgetown, D. C., and Great Falls, Md.—Continued.

Station.	Latitude.	Longitude.
MARYLAND—continued.		
	° ′ ″	° ′ ″
Davis triangulation station on ledge of rock, west side of towpath; elevation 119 feet	38 59 00.46	77 14 13.20
Lock No. 15, 380 feet south of, square cut in rock on west side of towpath; marked "120"	38 59 17.64	77 14 40.55
Lock No. 15, cross cut on southwest wing; elevation 126 feet	38 59 21.32	77 14 39.68
Lock No. 16, cross cut on south end of west wall; elevation 134 feet	38 59 30.50	77 14 40.62
Cross cut on top of west wall of gateway between locks 16 and 17; elevation 135 feet	38 59 35.83	77 14 43.37
Lock No. 17, □ cut on southwest corner of, south end of west wall; elevation 142 feet	38 58 45.90	77 14 52.92
Lock No. 18, top of bolt in south wall; elevation 150 feet	38 59 50.61	77 14 55.35
Great Falls, in southeast corner of stone gatehouse; bronze tablet stamped "Prim. Trav. Sta. No. 1"	39 00 01.86	77 14 53.10
L cut in stone wall at gate of dam	39 00 03.29	77 14 55.93
Towpath at branch	39 00 46.15	77 14 28.41
Towpath at branch	39 01 15.78	77 14 15.61
Grimes Lock (No. 21), at southwest part of, in top of stone wing; aluminum tablet stamped "Prim. Trav. Sta. No. 179 1907"	39 01 51.96	77 14 36.82

LAUREL QUADRANGLE.

From Arundel to Bowie.

Station.	Latitude.	Longitude.
	° ′ ″	° ′ ″
Arundel station, west track 100 feet north of	39 01 57.9	76 45 12.7
Road crossing (east track)	39 01 03.7	76 45 54.5
Bowie, east edge of road 25 feet north of north end of bridge over Philadelphia, Baltimore & Washington R. R.	39 00 29.4	76 46 44.5

Along highways.

Bowie, three corners near stone residence in northwest part of	39 00 38.7	76 46 55.7
White house, three corners, 300 feet east of	39 00 34.7	76 48 05.5
Three corners, telegraph road, 45 feet south to oak tree, 55 feet northwest to wild cherry tree	39 00 25.2	76 48 38.0
Forks of road to west at row of cedars	39 00 46.0	76 49 14.4
Three corners, 22 feet south to fence post, 40 feet north to pear tree	39 00 56.8	76 50 53.4
Four corners, 40 feet southeast to oak tree, 43 feet southwest to corner of dwelling	39 01 10.6	76 51 30.1
Forks of road, 15 feet east to forks of oak, 30 feet northwest to forks of oak	39 00 40.7	76 52 45.2
Forks of road to east, 200 feet east of stream	39 00 19.9	76 53 40.4
Four corners, 35 feet southeast to pine tree, 18 feet northwest to old stump	38 59 46.5	76 54 06.3
Branchville, road crossing	38 59 55.5	76 55 13.4
Blacksmith shop, three corners at	38 59 54.1	76 55 54.4
Forks, 15 feet south to oak tree, 40 feet northwest to gatepost	39 00 08.6	76 57 57.4
Avenel post office, three corners	39 00 14.7	76 58 51.9
Avenel post office, four corners, 1 mile southwest of, 31 feet northwest to nail in telephone pole, 30 feet to nail in cedar tree	38 59 58.1	76 59 44.2
Four corners, 30 feet east to north stone gatepost, 23 feet west to corner of Labyrinth's real estate office	39 01 12.5	77 00 46.8
Burnt Mills post office, forks of road, 300 feet south	39 01 50.1	77 00 19.0
Junction of Columbia pike and Bladensburg road at No. 2 tollgate	39 02 25.7	76 59 28.5
Three corners, 15 feet west to oak tree, 40 feet east to mail box	39 03 18.0	76 59 44.2
Colesville, four corners	39 04 32.8	77 00 07.8
Blacksmith shop, forks of road, 25 feet southeast to telephone pole, 35 feet southwest to telephone pole	39 05 20.8	77 00 00.4
Cloverly post office, three corners, 53 feet west to corner of dwelling, 60 feet south to cherry tree	39 06 42.6	76 59 42.8
Stabler triangulation station, U. S. Coast and Geodetic Survey	39 07 17.7	76 59 06.5

ROCKVILLE QUADRANGLE.

Along highways.

Station.	Latitude.	Longitude.
	° ′ ″	° ′ ″
Brink post office, three corners, 1 mile south of, at Neelsville Presbyterian Church, 50 feet east to wire fence, 40 feet northwest to yard corner	39 11 43.6	77 14 39.4
Middlebrook, four corners, 60 feet northwest to store corner, 45 feet southwest to stone fence corner	39 10 42.4	77 14 18.8
Seneca Creek, center of bridge over	39 10 00.9	77 13 37.4
Three corners, 40 feet east to tree at fence corner, 45 feet northeast to fence corner	39 09 27.7	77 13 04.7
Gaithersburg, cemented in north wall at northwest corner of brick store of Mr. R. A. Young at junction of Frederick Avenue and Chestnut Street, aluminum tablet stamped "Prim. Trav. Sta. No. 24"	39 08 37.6	77 12 06.2
Gaithersburg, Frederick Avenue crossing, Baltimore & Ohio R. R., 55 feet east to telegraph office, 40 feet northwest to crossing sign	39 08 29.2	77 11 55.4
Three corners	39 07 29.6	77 12 48.9
Three corners, 30 feet northeast to cedar tree, 35 feet southeast to fence corner	39 06 54.9	77 12 58.9
Three corners, at signboard, 35 feet north to signboard, 15 feet south to telephone pole	39 06 11.4	77 13 26.1
Three corners, 40 feet north to fence corner, 40 feet southwest to fence painted	39 05 00.9	77 14 55.0
Grimes Lock (No. 2), 3 corners, ½ mile north of, 29 feet southeast to nail in fence post, 36 feet southwest to nail in fence post	39 02 06.5	77 14 26.3
Grimes Lock (No. 21), cemented in coping stone of west wing wall to south end of, aluminum tablet stamped "Prim. Trav. Sta. No. 179"	39 01 52.0	77 14 36.8
Forks of road, 25 feet south to mark on fence	39 01 53.0	77 13 59.5
Three corners, 35 feet south to corner fence, 30 feet east to fence	39 01 36.8	77 13 13.6
Potomac, four corners, 75 feet northeast to southwest corner post office, 50 feet east to corner John Stone's store	39 01 05.0	77 12 33.1
Three corners, 30 feet south to wire fence, 30 feet northwest to fence corner	39 00 07.37	77 10 51.78
Cabin John Creek, crossroads 125 feet west of	38 59 48.49	77 10 11.26
Emery crossroads, 40 feet southeast to corner small dwelling, 25 feet south to stable corner	38 59 32.59	77 09 41.24
Cabin John Bridge, forks of road 1 mile northeast of, 25 feet east to wire fence corner, 50 feet north to telephone pole	38 59 00.18	77 08 15.22
Forks of road, 25 feet southeast to telephone pole, 25 feet north to forked cherry tree	38 59 23.98	77 07 17.70
Bethesda street-car station, three corners, ¾ mile south of, 25 feet east to car track, 50 feet southwest to store corner	39 00 00.38	77 06 35.48
Georgetown pike, three corners at	39 00 23.28	77 05 51.85
Bethesda street-car station, cemented in middle stone of west wall of culvert near Rock Creek on Georgetown pike, 0.8 mile east of, aluminum tablet stamped "Prim. Trav. Sta. No. 302"	39 00 21.57	77 05 51.93
Forks of road, 60 feet northeast to telephone pole, 50 feet east to telephone pole	38 59 46.06	77 05 48.51
Forest Glen, street-car crossing, 1 mile south of	38 59 59.76	77 04 37.59
Overhead bridge	38 59 52.06	77 03 25.67
Triangle, junction Brookville pike and road to Forest Glen, 45 feet southwest to cedar tree at gate, 25 feet northwest to telephone pole	39 00 34.55	77 02 27.25
Burnt Mills, four corners, 1 mile west of, junction Coleville pike and Blanchard and Wheaton road, 33 feet west to real estate office	39 01 12.5	77 00 46.8
Burnt Mills, four corners, 1 mile west of, cemented in north stone of gatepost to entrance to farm of Mr. Kolk; aluminum tablet stamped "Prim. Trav. Sta. No. 361"	39 01 12.6	77 00 46.0

WASHINGTON QUADRANGLE.

MARYLAND.

Along City & Suburban Electric Railway and highways near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Branchville, 0.5 mile west of; three corners at blacksmith shop	38 59 54.1	76 55 54.4	
Branchville, road crossing on City & Suburban Electric Ry	38 59 56.7	76 55 32.3	1,761
Hollywood, Richmond Avenue crossing on City & Suburban Electric Ry	39 00 37.5	76 55 21.3	4,220
Englewood, Beech Street crossing on City & Suburban Electric Ry	39 00 57.8	76 55 15.8	2,100
City & Suburban Electric Ry. and Washington-Baltimore road; center of crossing	39 01 45.3	76 54 56.7	5,041
Beltsville, Baltimore & Ohio R. R. at road crossing; center of main track	39 02 09.3	76 54 21.7	3,682
Four corners at top of hill, 55 feet southeast to cedar tree, 35 feet northeast to corner of fence	39 02 35.0	76 53 45.0	3,886
Muirkirk, 0.25 mile east of, 35 feet southeast to oak tree, 35 feet southwest to telephone pole; four corners	39 03 35.6	76 52 53.4	7,358
Contee, in west face of north brick gatepost at entrance to residence of Chas. R. Hoff, 60 feet east of east track of Baltimore & Ohio Ry. at road crossing, 125 feet south of station; aluminum tablet stamped "Prim. Trav. Sta. No. 1, 1912"	39 04 32.0	76 51 55.5	7,312

WASHINGTON QUADRANGLE—Continued.

Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Contee, road crossing at station; center of track of City & Suburban Electric Ry	39 04 38.5	76 52 20.6	2,085
Contee, 1 mile northwest of, 10 feet north to mail box; 18 feet south to cedar tree, 20 feet southeast to mail box; T road southwest	39 05 00.4	76 53 02.4	3,972
T road west, 35 feet northwest to corner of plank and wire fence	39 05 04.1	76 53 44.8	3,363
T road east, 40 feet south to oak tree, 30 feet northeast to mail box	39 04 50.3	76 55 10.0	6,868
T road west, 40 feet south to mail box	39 04 31.9	76 55 16.5	1,928
Soper triangulation station, 1,500 feet southwest of, 10 feet northeast to corner of rail fence, 20 feet south to post painted "U. S. 157"; T road southeast	39 05 03.4	76 57 04.9	9,125
Beltsville, 6 miles northwest of, on land of Benj. F. Miles, 92 feet east of old Columbia turnpike (Washington to Baltimore); center of granite pillar 2 feet 10 inches long with top 5 inches square (C. & G. S. triang. sta. Soper)	39 05 11.84	76 57 00.72	915
Fairland, in west face of south corner of stone foundation of old Soper dwelling, which is in northeast corner of crossroads, 120 feet north of center of crossroads; aluminum tablet stamped "Prim. Trav. Sta. No. 2, Maryland, 414, 1912"	39 04 34.7	76 57 28.9	4,370
Paint Branch, center of wooden bridge over	39 04 38.2	76 58 35.4	5,251
T road north, 25 feet northwest to mail box 81, 18 feet northeast to corner of wire fence	39 04 40.6	76 59 12.3	2,941
Colesville, four corners at	39 04 32.8	77 00 07.8	4,433
Colesville, in south wall of foundation of F. M. Hobb's residence, which is in northeast corner of crossroads; aluminum tablet stamped "Prim. Trav. Sta. No. 3, 1912"	39 04 33.2	77 00 07.1	68

The following geographic positions were established in 1912 by J. R. Ellis. The line starts from an adjusted position 1 mile east of Branchville and follows highways to Lanham, thence along the Pennsylvania Railroad to Ardwick station, thence by highway to Ardmore station, Brightseat, Seat Pleasant, and connects with the east District of Columbia monument. A line starts from an adjusted position 1 mile east of Seat Pleasant, follows public highways through Richie, Forestville, Camp Springs, and Friendly, and connects with the District of Columbia monument at Fox Ferry.

WASHINGTON QUADRANGLE.

MARYLAND.

Along highways and Pennsylvania Railroad near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Branchville, 1 mile east of; four corners	38 59 46.5	76 54 06.3	
Branchville, 2.5 miles east of; double pine tree at T road south	38 59 39.9	76 52 32.8	7,410
Branchville, 3 miles east of, at west point of triangle in forks; cross cut in blaze on white-oak tree	38 59 30.5	76 51 57.8	2,930
Lanham, 1.8 miles north of, on north side of field; east point of triangle at forks	38 59 05.3	76 51 45.6	2,731
Lanham, 1.2 miles north of, at log house, 22 feet west to blaze on small pine tree; center of crossroads	38 58 40.5	76 51 19.3	3,253
Lanham, 0.3 mile northeast of, in south end of retaining wall of west end of bridge over Pennsylvania R. R.; aluminum tablet stamped "Prim. Trav. Sta. No. 1, 1912"	38 57 50.7	76 51 30.9	5,137
Lanham, east track of Pennsylvania R. R. at road crossing	38 57 34.0	76 51 47.6	2,137
Ardwick station, middle track of Pennsylvania R. R. at road crossing	38 56 40.8	76 52 35.4	6,576
Ardmore station, crossing of pike under Washington, Baltimore & Annapolis R. R. (electric)	38 56 19.0	76 51 26.6	5,858

WASHINGTON QUADRANGLE—Continued.

Along highways and Pennsylvania Railroad near east border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Junction of Ardwick Avenue north-south and Lincoln Avenue east	38 55 48.5	76 51 35.4	3,162
Brightseat, 0.3 mile northwest of, on south side of T road northeast; red oak tree	38 55 07.4	76 51 41.4	4,189
Brightseat, center of T road northeast	38 55 00.3	76 51 20.2	1,820
Brightseat, 1 mile south of; cross on top of stone monument in gateway	38 54 25.7	76 51 11.2	3,569
Brightseat, 1.5 miles east of; center of intersection of Central Avenue and T road north	38 53 28.5	76 51 02.5	5,825
Brightseat, 1.2 miles east of; Central Avenue at private road south	38 53 25.2	76 51 24.0	1,737
Brightseat, just east of blacksmith shop; center of T road north	38 53 18.6	76 52 40.6	6,091
District station, 0.8 mile southeast of; center of crossroads at store	38 53 12.5	76 53 54.3	5,860
East corner monument of District of Columbia	38 53 34.23	76 54 33.94	3,828
Richie station, 0.8 mile northwest of; road crossing under Chesapeake Beach R. R	38 52 42.7	76 51 46.1	.....
Richie station, just west of; road crossing on Chesapeake Beach R. R	38 52 11.2	76 51 21.1	3,764
Richie station, in concrete floor at entrance to store; aluminum tablet stamped "Prim. Trav. Sta. No. 2, 165, 1912"	38 52 07.5	76 51 20.3	372
Richie station, 1 mile southwest of, center of Richie-Forestville pike at T road east	38 51 36.9	76 52 18.0	5,511
Forestville, 20 feet west to "Ele. 280.1" on telephone pole, 36 feet north to corner post; crossing of Marlboro turnpike and north-south turnpike	38 50 40.3	76 52 27.2	5,776
Forestville, 2 miles south of; center of crossroads	38 49 03.0	76 52 40.4	9,905
Camp Springs, 1 mile northeast of; center of T turnpike northwest	38 48 41.5	76 53 44.2	5,491
Camp Springs, in top of concrete retaining wall of south end of culvert, 20 feet east by 5 feet north to center of cross pikes; aluminum tablet stamped "Prim. Trav. Sta. No. 3, 1912"	38 48 13.5	76 54 25.9	4,357
Pagetts Corners, center of cross pikes at	38 47 35.2	76 55 44.3	7,314

Along highway near south border of quadrangle.

Schoolhouse, center of crossroads	38 47 15.1	76 56 19.3	3,424
Friendly, 2 miles northeast of; center of T pike southeast	38 46 35.2	76 57 07.9	5,583
Friendly, 1.25 miles northeast of, 20 feet south by 15 feet west to Steed's mail box; center of Camp Springs-Friendly road at road east	38 45 42.3	76 57 23.6	5,497
Hyland Harmon's mail box on south side of forks	38 45 20.4	76 57 53.3	3,232
Friendly, 20 feet south to Geo. M. Boland's mail box; center of T road northeast	38 45 06.0	76 58 42.9	4,191
Friendly, 1 mile west by 0.5 mile north of; center of T turnpike west of saloon	38 45 30.5	76 59 46.2	5,590
New Glatz, 1 mile south of; forks of road	38 45 40.3	77 00 18.7	2,752
New Glatz, 20 feet west by 10 feet south to corner of yard fence; T road west at store	38 46 38.2	77 00 22.4	5,866
Fox Ferry, 0.5 mile southeast of; T road east	38 47 48.1	77 01 10.9	8,039
Fox Ferry, District of Columbia monument	38 48 05.57	77 01 35.39	2,625

NEBRASKA AND KANSAS.

PRIMARY TRAVERSE.

Falls City, Howe, Humboldt, Nemaha, Tecumseh, and Hiawatha quadrangles.

NEMAHA, PAWNEE, AND RICHARDSON COUNTIES, NEBR.; BROWN COUNTY, KANS.

The following geographic positions on approximate North American datum were determined by J. R. Ellis in 1913 and by F. W. Crisp in 1915 and are based upon primary traverse positions determined in 1905, described in Bulletin 276, and upon Missouri River Commission triangulation station St. Deroin.

HIAWATHA QUADRANGLE, KANS.

Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T road east, center of intersection of	39 59 59.0	95 43 48.3	
Falls City, 4 miles south of, 30 feet south of road, in stone hitching post in front of Mr. Fred. Zorn's residence; aluminum tablet stamped "Prim. Trav. Sta. No. 21 Nebr., 1913, elev. 1027"	39 59 59.8	95 35 56.3	
T. 1 N., Rs. 16 and 17 E., south corner of secs. 31 and 36; center of T road north; Nebraska-Kansas State line	39 59 59.9	95 33 28.4	
T. 1 S., R. 17 E., north corner of secs. 5 and 6; center of T road south; Nebraska-Kansas State line	39 59 59.8	95 32 45.9	3,310
T. 1 N., R. 17 E., south corner of secs. 31 and 32; center of T road north; Nebraska-Kansas State line	39 59 59.8	95 32 20.2	1,970
T. 1 S., R. 17 E., north corner of secs. 4 and 5, center of T road south; Nebraska-Kansas State line	39 59 59.7	95 31 38.6	3,270
T. 1 N., R. 17 E., south corner of secs. 32 and 33; center of T road north; Nebraska-Kansas State line	39 59 59.7	95 31 12.6	

Magnetic declination of northeast quarter of quadrangle 9.5° E.

FALLS CITY QUADRANGLE, NEBR.

Along Chicago, Burlington & Quincy Railway.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Verdon, 3.50 miles south of, 25 feet north and 50 feet east of center of road crossing; iron post stamped "Prim. Trav. Sta. No. 17, Nebr., 1913, Elev. 938"	40 06 06.90	95 43 05.50	
Road crossing, center of track at	40 05 40.4	95 43 06.3	2,686
Chicago, Burlington & Quincy Ry., center of track at road crossing	40 05 14.4	95 43 06.8	2,629
Creek crossing under concrete culvert "26.93," center of track at	40 05 27.9	95 43 20.2	1,718
Wooden trestle "27.88" over creek, center of track at	40 05 49.9	95 44 17.0	4,939
Tps. 1 N. and 1 S., R. 15 E., ¼ corner secs. 4 and 33, T road south on State line	40 00 01.1	95 44 55.3	
T road north on State line, center of	40 00 01.1	95 44 47.1	640
T road north, center of intersection at	40 00 01.4	95 43 39.6	
T road south, on State line, center of intersection at	40 00 01.1	95 42 39.3	4,700
T road north, on State line, center of intersection at	40 00 01.1	95 42 31.7	590
Salem, 5 miles south and 0.50 mile east of, 200 feet north of State line, in west face of stone foundation of barn owned by Amos Thompson; aluminum tablet stamped "Prim. Trav. Sta. No. 19, Nebr., 1913"	40 00 03.00	95 42 18.10	1,077

FALLS CITY QUADRANGLE, NEBR.—Continued.

Along Missouri Pacific Railway to Verdon, thence south along Chicago, Burlington & Quincy Railroad to Salem, thence south along highways to State line (near west border of quadrangle).

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Stella, 3 miles southeast of, southeast corner of road crossing, 30 feet north by 70 feet west to center of east-west road crossing; iron post stamped "Prim. Trav. Sta. No. 15, Nebr., 1913, elev. 967"	40 11 46.8	95 44 48.8	.....
East-west road crossing, 150 feet east of this position is south corner of secs. 33 and 34, T. 3 N., R. 14 E., T road north	40 10 28.6	95 43 42.8	9,429
East-west road crossing, 1,020 feet to trestle over creek southwest	40 09 36.4	95 43 14.8	5,710
Verdon, 0.25 mile northwest of; west side of road crossing Missouri Pacific Ry., 130 feet east by 10 feet north to center of road crossing; iron post stamped "Prim. Trav. Sta. No. 16, Nebr., 1913, elev. 935"	40 09 01.1	95 42 58.9	3,779
East-west road crossing under bridge	40 07 51.4	95 42 51.9	7,071
Verdon, 2.5 miles south of, east-west road crossing	40 06 58.9	95 43 01.3	5,361
Verdon, 3.5 miles south of; northeast corner of crossroads, 25 feet south by 50 feet west to center of road crossing; iron post stamped "Prim. Trav. Sta. No. 17, Nebr., 1913, elev. 938"	40 06 06.9	95 43 05.5	5,274
Salem, track opposite semaphore	40 04 46.8	95 42 37.6	8,389
Salem, center of steel bridge over Great Nemaha River	40 04 32.6	95 43 02.5	2,418
Salem, 0.5 mile south of; in northwest corner of stone abutment of bridge over South Fork of Great Nemaha River; iron post stamped "915 Prim. Trav. Sta. No. 18, Nebr., 1913"	40 04 08.2	95 43 05.5	2,478
Center of steel bridge over large ditch east	40 03 43.7	95 42 31.9	3,598
T. 1 N., R. 15 E., corner of secs. 14, 15, 22, and 23; center of T road east	40 02 37.7	95 42 31.5	6,679
T. 1 N., R. 15 E., stone at corner of secs. 22, 23, 26, and 27; center of crossroads	40 01 45.5	95 42 31.5	5,280
T. 1 N., R. 15 E., corner of secs. 26, 27, 34, and 35; center of crossroads	40 00 53.1	95 42 31.7	5,300

Along highways near south border of quadrangle.

T. 1 N., R. 15 E., south corner of secs. 34 and 35; Kansas-Nebraska State line	40 00 01.0	95 42 31.8	.....
Salem, 5 miles south by 0.5 mile east of, just north of Nebraska-Kansas State line, in west face of barn owned by Amos Thompson; aluminum tablet stamped "1102 Prim. Trav. Sta. No. 19, Nebr., 1913"	40 00 03.0	95 42 18.1	1,085
T. 1 S., R. 15 E., north corner of secs. 1 and 2, center of T road south, Kansas-Nebraska State line	40 00 00.7	95 41 31.0	3,616
T. 1 S., Rs. 15 and 16 E., north corner of secs. 1 and 6, center of T road south; Nebraska-Kansas State line	40 00 00.6	95 40 22.1	5,360
T. 1 S., Rs. 15 and 16 E., south corner of secs. 31 and 36; center of T road north; Nebraska-Kansas State line	40 00 00.6	95 40 16.0	480
T. 1 S., R. 16 E., corner of secs. 5 and 6; center of T road south; Nebraska-Kansas State line	40 00 00.5	95 39 30.6	3,530
Falls City, 4 miles south by 4 miles west of, on State line road; stone gatepost to entrance of Wm. Booth's farm; aluminum tablet stamped "999 Prim. Trav. Sta. No. 20, Nebr., 1913"	40 00 00.8	95 39 14.5	1,255
T. 1 N., R. 16 E., stone at south corner of secs. 31 and 32; center of T road north; Nebraska-Kansas State line	40 00 00.5	95 39 08.1	496
T. 1 S., R. 16 E., north corner of secs. 4 and 5; center of T road south; Nebraska-Kansas State line	40 00 00.4	95 38 22.5	3,550
T. 1 N., R. 16 E., south corner of secs. 32 and 33; center of T road north; Nebraska-Kansas State line	40 00 00.4	95 38 00.3	1,730
T. 1 S., R. 16 E., north corner of secs. 3 and 4; center of T road south; Nebraska-Kansas State line	40 00 00.2	95 37 14.5	3,560
T. 1 N., R. 16 E., stone south corner secs. 33 and 34, T road north; Nebraska-Kansas State line	40 00 00.2	95 36 52.3	1,730
T. 1 S., R. 16 E., corner of secs. 2 and 3, center of T road south; Nebraska-Kansas State line	40 00 00.1	95 36 06.4	3,570
T. 1 S., R. 16 E., south corner of secs. 34 and 35; center of T road north, Nebraska-Kansas State line	40 00 00.0	95 35 44.3	.....
T. 1 S., R. 16 E., north corner of secs. 1 and 2; center of T road south; Nebraska-Kansas State line	40 00 00.0	95 34 58.2	3,590
Preston, 2 miles south by 0.3 mile west of, 280 feet east of north corner of secs. 4 and 5, T. 1 S., R. 17 E., in south foundation wall of barn on north side of State line road; aluminum tablet stamped "1028 Prim. Trav. Sta. No. 22, Nebr., 1913"	40 00 02.4	95 31 35.1	.....
T. 1 N., R. 17 E., corner of secs. 28, 29, 32, and 33; center of crossroads	40 00 51.9	95 31 12.6	.....
T. 1 N., R. 17 E., corner of secs. 20, 21, 28, and 29; center of crossroads	40 01 44.2	95 31 12.7	5,290
Preston, 0.25 mile east of, at northwest corner of road crossing, 30 feet east by 60 feet south to center of road crossing Chicago, Burlington & Quincy R. R.; iron post stamped "881 Prim. Trav. Sta. No. 23 Nebr., 1913"	40 02 12.2	95 30 55.7	3,129

FALLS CITY QUADRANGLE, NEBR.—Continued.

Along highways near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Great Nemaha River, center of steel bridge over	40 03 19.8	95 30 55.0	.....
Preston, 2.5 miles north of; northeast corner of crossroads, 35 feet south by 30 feet west to corner of secs. 4, 5, 8, and 9, T. 1 N., R. 17 E.; iron post stamped "Prim. Trav. Sta. No. 24, Nebr., 1913, elev. 976"	40 04 20.8	95 31 12.1	6,312
Tps. 1 and 2 N., R. 17 E., stone at corner of secs. 4, 5, 32, and 33; center of crossroads	40 05 12.8	95 31 12.6	5,260
T. 2 N., R. 17 E., corner of secs. 28, 29, 32, and 33; center of crossroads	40 06 05.0	95 31 12.9	5,290
Preston, 5.5 miles north of; at northwest corner of crossroads, 30 feet south by 30 feet east of corner of secs. 20, 21, 28, and 29, T. 2 N., R. 17 E.; iron post stamped "Prim. Trav. Sta. No. 25, Nebr., 1913, elev. 981"	40 06 57.7	95 31 13.5	5,335
T. 2 N., R. 17 E., corner of secs. 16, 17, 20, and 21; center of crossroads	40 07 49.5	95 31 13.4	5,245
Arago, corner of secs. 8, 9, 16, and 17, T. 2 N., R. 17 E., center of crossroads	40 08 41.8	95 31 12.2	5,391
T. 2 N., R. 17 E., corner of secs. 4, 5, 8, and 9; center of crossroads	40 09 34.0	95 31 11.2	5,285
T. 2 N., R. 17 E., corner of secs. 5, 6, 7, and 8; center of crossroads	40 09 34.3	95 32 19.2	5,280
T. 2 N., Rs. 16 and 17 E., corner of secs. 1, 6, 7, and 12; center of crossroads	40 09 34.4	95 33 31.0	5,570
Tps. 2 and 3 N., Rs. 16 and 17 E., stone at corner of secs. 1, 6, 31, and 36; center of crossroads	40 10 30.0	95 33 31.3	5,628
T. 3 N., Rs. 16 and 17 E., corner of secs. 25, 30, 31, and 36; center of crossroads	40 11 21.9	95 33 31.8	5,246
T. 3 N., Rs. 16 and 17 E., corner of secs. 19, 24, 25, and 30; center of crossroads	40 12 14.0	95 33 32.2	5,280
T. 3 N., Rs. 16 and 17 E., corner of secs. 13, 18, 19, and 24; center of crossroads	40 13 06.0	95 33 33.6	5,259
T. 3 N., Rs. 16 and 17 E., corner of secs 7, 12, 13, and 18; center of crossroads	40 13 58.1	95 33 34.2	5,279

Magnetic declination for south border of quadrangle 9.5° E.; for east border, 9.7° E.

HOWE QUADRANGLE, NEBR.

From Julian south along Missouri Pacific Railway to Richardson-Nemaha county line.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Primary traverse station No. 4, 1905	40 30 31.5	95 52 38.7	.....
Julian, 2 miles south of; east-west road crossing	40 29 39.0	95 51 45.1	6,732
Julian, 3 miles south of; on east side of track at road crossing; iron post stamped "Prim. Trav. Sta. No. 1, Nebr., 1913, elev. 975"	40 28 47.2	95 51 54.6	5,302
East-west road crossing	40 27 28.5	95 51 49.9	7,966
North Auburn, east-west road crossing	40 26 35.9	95 51 48.0	5,330
Nebraska Junction, 1 mile north of; on west side of Missouri Pacific Ry. track at township line crossing, 30 feet south by 60 feet east to center of railroad crossing; iron post stamped "Prim. Trav. Sta. No. 2, Nebr., 1913, elev. 928," 30 feet south by 570 feet west of this position is quarter corner south side of sec. 32, T. 6 N., R. 14 E.	40 26 10.6	95 51 48.0	2,552
Nebraska Junction, switch block	40 25 15.9	95 51 38.5	5,591
East-west road crossing section line	40 24 26.4	95 50 43.2	6,588
Auburn, 0.5 mile northwest of; on east side of north-south road and just north of tracks, 25 feet west by 80 feet south to center of road crossing; iron post stamped "Prim. Trav. Sta. No. 3, Nebr., 1913"	40 24 07.2	95 50 18.2	2,742
Auburn station, 0.25 mile southeast of; east-west road crossing section line	40 23 34.1	95 49 38.6	4,543
North-south road crossing, just north of tile works	40 23 11.1	95 49 10.2	3,197
T. 5 N., R. 14 E., corner of secs. 22, 23, 26, and 27	40 22 42.1	95 49 09.7	2,938
Crossing of Missouri Pacific and of Chicago, Burlington & Quincy railroads	40 21 43.0	95 48 36.5	6,507
Milepost 410, just south of; east-west section line road crossing	40 20 57.9	95 48 41.7	4,587
Howe, 1 mile north of; east-west section line road crossing	40 20 02.9	95 48 54.8	5,652
Howe, 430 feet south of station; east-west road crossing	40 19 10.8	95 49 14.9	5,494
East-west road crossing, 240 feet east of this crossing is corner of secs. 14, 15, 22, and 23, T. 4 N., R. 14 E	40 18 18.4	95 49 22.1	5,340
Howe, 2 miles south of; at southeast corner of road crossing, 30 feet north by 43 feet west to center of road crossing Missouri Pacific Ry.; iron post stamped "Prim. Trav. Sta. No. 4, 1913, elev. 1056"	40 17 25.9	95 49 27.3	5,325

HOWE QUADRANGLE, NEBR.—Continued.

From Julian south along Missouri Pacific Railway to Richardson-Nemaha county line—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 4 N., R. 14 E., corner of secs. 26, 27, 34, and 35, 25 feet west to crossroads	40 16 34.0	95 49 19.3	5,290
Nemaha-Richardson county line; east-west road crossing	40 15 41.9	95 48 40.8	6,059
Stella, 2 miles northwest of, on west side of wagon road just south of road crossing, 35 feet east by 75 feet north to center of road crossing; iron post stamped "Prim. Trav. Sta. No. 13, Nebr., 1913, elev. 982"	40 15 18.0	95 48 11.7	3,308
Along highways near south border of quadrangle.			
T. 4 N., R. 14 E., corner of secs. 27, 28, 33, and 34; center of crossroads	40 16 33.8	95 50 27.1	.....
T. 4 N., R. 14 E., center of T road west, at south corner of secs. 33 and 34; Nemaha-Richardson county line	40 15 41.5	95 50 27.3	5,286
Tps. 3 and 4 N., R. 14 E., stone at corner of secs. 4, 5, 32, and 33; Nemaha-Richardson county line; center of crossroads	40 15 41.1	95 51 35.8	5,310
Howe, 4 miles south by 3 miles west of, at northeast corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 5, Nebr., 1913, 1082," (20 feet south by 3 feet west of this position is stone at secs. 5, 6, 31, and 32, Tps. 3 and 4 N., R. 14 E., Nemaha-Richardson county line)	40 15 40.8	95 52 43.8	5,277
Tps. 3 and 4 N., Rs. 13 and 14 E., corner of secs. 1, 6, 31, and 36, center of T road north on Nemaha-Richardson county line	40 15 40.3	95 53 52.2	5,300
Tps. 3 and 4 N., R. 13 E., corner of secs. 1, 2, 35, and 36; center of crossroads on Nemaha-Richardson county line	40 15 40.4	95 54 59.8	5,246
Pleasant View M. E. Church, at northwest corner of crossroads, 30 feet south by 30 feet east to stone at corner of secs. 2, 3, 34, and 35, Tps. 3 and 4 N., R. 13 E., near Nemaha-Richardson county line; iron post stamped "Prim. Trav. Sta. No. 6, Nebr., 1913, 1162"	40 15 40.9	95 56 40.9	5,320
Tps. 3 and 4 N., R. 13 E., corner of secs. 3, 4, 33, and 34, center of crossroads on Nemaha-Richardson county line	40 15 40.8	95 57 16.2	5,250
Tps. 3 and 4 N., R. 13 E., corner of secs. 4, 5, 32, and 33, center of crossroads on Nemaha-Richardson county line	40 15 40.9	95 58 24.0	5,260
Tps. 3 and 4 N., R. 13 E., 20 feet south by 30 feet east to corner of secs. 5, 6, 31, and 32, northwest corner of crossroads, Nemaha-Richardson county line; iron post stamped "Prim. Trav. Sta. No. 7, Nebr., 1913, 1125"	40 15 40.9	95 59 32.1	5,282
T. 4 N., R. 13 E., corner of secs. 29, 30, 31, and 32; center of crossroads	40 16 32.8	95 59 31.7	5,254
T. 4 N., R. 13 E., corner of secs. 19, 20, 29, and 30, center of crossroads	40 17 24.8	95 59 32.2	5,270
Along highways near west border of quadrangle.			
Johnson, 7 miles south by 0.5 mile east of, 25 feet north by 35 feet east to stone at corner of secs. 17, 18, 19, and 20, T. 4 N., R. 13 E., at southwest corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 8, Nebr., 1913, 1190"	40 18 16.4	95 59 32.5	5,225
T. 4 N., R. 13 E., corner of secs. 7, 8, 17, and 18; center of crossroads	40 19 08.9	95 59 31.9	5,310
Timber Creek Lutheran Church spire	40 19 50.0	95 59 46.8	5,015
T. 4 N., R. 13 E., corner of secs. 5, 6, 7, and 8, 20 feet west to box culvert	40 20 01.0	95 59 31.8	5,280
Johnson, 4 miles south by 0.5 mile east of; northeast corner of T road north, 30 feet south by 30 feet west to south corner of secs. 31 and 32, T. 5 N., R. 13 E.; iron post stamped "Prim. Trav. Sta. No. 9, Nebr., 1913, 1116"	40 20 57.4	95 59 23.5	5,749
T. 5 N., R. 13 E., corner of secs. 29, 30, 31, and 32; center of crossroads	40 21 49.3	95 59 24.3	5,249
Center of crossroads; 15 feet south by 10 feet west to mail box	40 22 40.8	95 59 24.8	5,220
Johnson, 1 mile south by 0.5 mile east of; southeast corner of crossroads, 30 feet north by 30 feet west to corner of secs. 17, 18, 19, and 20, T. 5 N., R. 13 E.; iron post stamped "Prim. Trav. Sta. No. 10, Nebr., 1913, 1168"	40 23 33.3	95 59 24.3	5,314
T. 5 N., R. 13 E., corner of secs. 7, 8, 17, and 18; center of crossroads	40 24 25.8	95 59 24.9	5,308
T. 5 N., R. 13 E., corner of secs. 5, 6, 7, and 8; center of crossroads	40 25 18.0	95 59 25.1	5,290
Tps. 5 and 6 N., R. 13 E., corner of secs. 5, 6, 31, and 32; center of crossroads	40 26 10.0	95 59 24.6	5,260
Johnson, 3 miles north by 0.5 mile east of; southeast corner of crossroads, 35 feet north by 30 feet west to corner of secs. 29, 30, 31, and 32, T. 6 N., R. 13 E.; iron post stamped "Prim. Trav. Sta. No. 11, Nebr., 1913, 1049"	40 27 02.0	95 59 25.5	5,260
T. 6 N., R. 13 E., corner of secs. 19, 20, 29, and 30; center of crossroads	40 27 54.6	95 59 27.3	5,330

HOWE QUADRANGLE, NEBR.—Continued.

Along highways near west border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Johnson, 5 miles north by 0.5 mile east of; 25 feet west by 35 feet north to corner of secs. 17, 18, 19, and 20, T. 6 N., R. 13 E., at southeast corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 12, Nebr., 1913, 1044"	40 28 46.5	95 59 28.2	5,259
T. 6 N., R. 13 E., stone at corner of secs. 7, 8, 17, and 18; center of T road west	40 29 39.2	95 59 29.3	5,330
T. 6 N., R. 13 E.. corner of secs. 5, 6, 7, and 8; center of crossroads.	40 30 31.3	95 59 30.0	5,280
Primary traverse station No. 5, 1905, 968	40 31 23.2	96 00 28.1	6,908

Magnetic declination for south border of quadrangle, 10.2° E.; west border, 8.8° E.

NEMAHA QUADRANGLE, NEBR.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
St. Dercin, 0.8 mile above, on narrow ridge, in southwest quarter of sec. 25, T. 4 N., R. 16 E.; iron post (Missouri River Commission triangulation station St. Deroin)	40 16 46.45	95 34 17.22	.....

Magnetic declination for south border of quadrangle, 9.7° E.

HUMBOLDT QUADRANGLE, NEBR.

Along Missouri Pacific Railway near northeast corner of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
East-west road crossing (150 feet east of this position is quarter corner)	40 14 50.1	95 47 39.2	.....
East-west road crossing (1,500 feet west of this position is corner of secs. 1, 12, 13, and 18, T. 3 N., R. 14 E., T road south)	40 13 57.8	95 46 43.1	6,844
Stella, in the northwest part of; on east side of track, at road crossing, 30 feet north by 100 feet west to center of road crossing; iron post stamped "Prim. Trav. Sta. No. 14, Nebr., 1913, elev. 974"	40 13 57.6	95 46 41.8	103
East-west road crossing (280 feet west of this position is corner of secs. 17, 18, 19, and 20, T. 3 N., R. 14 E.)	40 13 06.2	95 45 54.3	6,377

Magnetic declination for north border of quadrangle, 10.2° E.; southeast corner, 9.7° E.

T road north, center of intersection at	40 00 53.6	95 53 34.2	3,910
T. 1 N., R. 14 E., ¼ corner secs. 30 and 31, center of triangle at T road south	40 00 53.6	95 53 16.5	1,380
T. 1 N., R. 13 E., near southwest corner sec. 29, 200 feet west of John Burgett's residence, 10 feet west of windmill, in top of cement cover of well; bronze tablet stamped "Prim. Trav. Sta. No. 13, Nebr., 1915, elev. 1212"	40 00 54.3	95 52 27.5	3,810
T. 1 N., R. 14 E., corner secs. 28, 29, 32, and 33, T road north at	40 00 53.6	95 51 35.3	4,066
T road south, center of intersection at	40 00 53.6	95 51 06.9	2,210
Spring Creek, center of iron bridge over east fork of	40 00 16.2	95 50 54.7	3,899
T. 1 N., R. 14 E., in southeast corner of T road north, 15 feet south and 50 feet east of ¼ corner secs. 3 and 34, T. 1 S., R. 14 E., on Kansas-Nebraska State line; iron post stamped "Prim. Trav. Sta. No. 14, Nebr., 1915"	40 00 01.1	95 49 52.2	5,102
T road south, center of intersection at	40 00 01.3	95 49 32.4	1,537
T road south, center of intersection at	40 00 01.1	95 48 24.6	5,280
Tps. 1 N. and 1 S., R. 14 E., corner secs. 1, 2, 35, and 36, on Kansas-Nebraska State line, T road north	40 00 01.0	95 48 11.1	1,050
T road north, on Kansas-Nebraska State line	40 00 01.0	95 47 03.4	5,277
T road south, on Kansas-Nebraska State line	40 00 01.0	95 46 04.6	4,570
Tps. 1 N. and 1 S., R. 15 E., in northeast corner of T road north on State line, 30 feet north and 25 feet east of intersection of roads; iron post stamped "Prim. Trav. Sta. No. 15, Nebr., 1915, elev. 1188"	40 00 01.1	95 45 36.8	2,168

Magnetic declination for north border of quadrangle, 10° 15′ E.; for south border, 9° 25′ E.; for west border, 9° 25′ E.; for center border, 10° 30′ E.

HUMBOLDT QUADRANGLE, NEBR.—Continued.

Along highways.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Long Branch, 200 feet east of bridge over public T road north	40 14 23.0	95 59 32.1	

Along Chicago, Burlington & Quincy Railroad.

Second-class road crossing, center of track at	40 05 56.6	95 45 21.9	
Dawson, 3 miles east of, center of track at	40 06 03.8	95 46 29.9	5,331
Dawson, 2.50 miles east of, in sec. 30, T. 2 N., R. 15 E., south side of west end of concrete culvert; bronze tablet stamped "Prim. Trav. Sta. No. 1, Nebr., 1915"	40 06 13.1	95 47 02.7	2,720
Dawson, 1.50 miles east of; center of track at second-class road crossing	40 06 51.5	95 47 59.0	5,851
Dawson, 1 mile east of; center of track at second-class road crossing	40 07 05.2	95 48 28.1	2,652
Dawson, 0.50 mile east of, 100 feet east of concrete culvert "32.80;" center of track at road crossing	40 07 23.0	95 49 15.7	4,110
Dawson, 300 feet east of station, 24 feet east of water tank, 8 feet north of main track, in southwest corner of square concrete well, 5 feet south of northwest corner and 3.95 feet west of southeast corner of rim; bronze tablet stamped "Prim. Trav. Sta. No. 2, Nebr., 1915"	40 07 34.7	95 49 47.1	2,717
Dawson, 1.36 miles west of; center of track at public road crossing	40 07 44.6	95 51 18.7	7,183
Dawson, 2.25 miles west of; center of track at second-class road crossing	40 08 02.2	95 52 15.1	4,720
Dawson, 2.70 miles west of; in T. 2 N., R. 14 E., near southwest corner sec. 17, 82 feet north of track, 25 feet east of road, 1 foot north of fence corner; iron post stamped "Prim. Trav. Sta. No. 3, Nebr., 1915"	40 08 09.7	95 52 42.9	2,291
Humboldt, 2.90 miles east of; center of track at second-class road crossing	40 08 41.7	95 53 43.6	5,717
Humboldt, 2.30 miles east of; center of track at public road crossing	40 08 49.6	95 54 23.7	3,212
Humboldt, 1.50 miles east of; center of track at second-class road crossing	40 09 05.7	95 55 16.3	4,398
Humboldt, 0.80 mile east of; center of track at second-class road crossing	40 09 33.0	95 55 49.0	3,750
Humboldt, 150 feet east of station; center of main track at Main Street crossing of Chicago, Burlington & Quincy Ry	40 09 29.2	95 56 40.5	4,015
Humboldt, 925 feet southwest of, at east end of iron bridge over Long Branch Creek, in top of north end of center concrete pile; bronze tablet stamped "Prim. Trav. Sta. No. 4, Nebr., 1915"	40 09 26.6	95 56 51.9	925
Humboldt, 1.25 miles west of Main Street crossing, center of track at public road crossing	40 09 28.3	95 58 05.6	5,724
Humboldt, 2.35 miles west of, T road north	40 09 36.2	95 59 18.7	5,733

Along highways near west border of quadrangle.

Nemaha River, center of iron bridge over	40 09 00.7	95 56 37.0	
Humboldt, 0.90 mile south of; T road west	40 08 47.5	95 56 43.1	1,411
T. 2 N., R. 13 E., corner secs. 9, 10, 15, and 16, T road south	40 08 44.0	95 57 15.0	2,504
T road north	40 08 44.1	95 58 02.8	3,710
T. 2 N., R. 13 E., corner secs. 8, 9, 16, and 17, turn in road to south	40 08 44.0	95 58 22.9	1,560
T. 2 N., R. 13 E., 40 feet south and 30 feet west of corner of secs. 16, 17, 20, and 21, in southwest corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 8, Nebr., 1915"	40 07 51.6	95 58 22.9	5,300
T. 2 N., R. 13 E., corner secs. 20, 21, 28, and 29, crossroads	40 06 59.6	95 58 22.1	5,259
T. 2 N., R. 13 E., 60 feet north and 20 feet east of corner secs. 28, 29, 32, and 33, in northeast corner of crossroads, 5 feet north of fence corner; iron post stamped "Prim. Trav. Sta. No. 9, Nebr., 1915"	40 06 07.8	95 58 21.7	5,240
T road west	40 05 28.0	95 58 22.1	4,030
T. 1 N., R. 13 E., corner secs. 4, 5, 8, and 9, T road west	40 04 23.3	95 58 26.0	6,553
South Fork, 420 feet south of iron bridge over; T road east	40 04 15.1	95 58 24.8	837
T. 1 N., R. 13 E., corner secs. 8, 9, 16 and 17, T road east	40 03 31.0	95 58 24.2	4,461
T. 1 N., R. 13 E., 50 feet south and 10 feet west of corner of secs. 16, 17, 20, and 21, in southwest corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 10, Nebr., 1915	40 02 38.5	95 58 23.9	5,310
T. 1 N., R. 13 E., corner secs. 20, 21, 28, and 29, crossroads	40 01 46.5	95 58 23.5	5,260
T. 1 N., R. 13 E., 55 feet south and 35 feet east of ¼ corner secs. 28 and 29, in southeast corner of T road north; iron post stamped "Prim. Trav. Sta. No. 11, Nebr., 1915"	40 01 19.9	95 58 22.4	2,698

HUMBOLDT QUADRANGLE, NEBR.—Continued.

Along highways near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T road west, center of intersection at	40 01 19.6	95 57 15.6	5,200
T road east, center of intersection at	40 01 27.3	95 57 15.6	778
T. 1 N., R. 13 E., 10 feet west of SE. corner of SW. ¼ of NW. ¼ sec. 26, in northwest corner of crossroads, in east side of concrete culvert; bronze tablet stamped "Prim. Trav. Sta. No. 12, Nebr., 1915, elev. 1168"	40 01 20.2	95 55 49.8	6,716
Easley Creek, center of iron bridge over	40,01 24.0	95 54 58.8	3,984
T. 1 N., R. 13 E., in sec. 25, T road west	40 01 33.1	95 54 24.7	2,809
T. 1 N., R. 13 E., ¼ corner secs. 25 and 36, T road north	40 00 53.9	95 54 24.4	3,970

TECUMSEH QUADRANGLE, NEBR.

Along highways near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Humboldt, 3 miles west of, T road south	40 09 36.3	96 00 04.2	.....
Humboldt, 3.50 miles west of, T. 2 N., Rs. 12 and 13 E., corner secs. 1, 6, 7, and 12, 35 feet northwest of, 25 feet west of north and south road; iron post stamped "Prim. Trav. Sta. No. 5, Nebr., 1915"	40 09 36.5	96 00 36.4	2,506
Tps. 2 and 3 N., Rs. 12 and 13 E., crossroads at	40 10 28.2	96 00 36.1	5,230
T. 3 N., Rs. 12 and 13 E., corner secs. 25, 30, 31, and 36, crossroads	40,11 20.4	96,00,35.9	5,280
T. 3 N., Rs. 12 and 13 E., 30 feet north and 20 feet east of T road east at secs. 24 and 25, 3 feet north of fence corner; iron post stamped "Prim. Trav. Sta. No. 6, Nebr., 1915"	40 12 15.2	96 00 35.3	5,552
T. 3 N., Rs. 12 and 13 E., corner secs. 13, 24, 18, and 19, is intersection of crossroads on Pawnee-Richardson county line	40 13 04.6	96 00 35.6	4,998
T. 3 N., Rs. 12 and 13 E., ¼ corner secs. 7 and 12, on Pawnee-Richardson county line, 17 feet west of telephone pole, 46 feet south of fence corner; iron post stamped "Prim. Trav. Sta. No. 7, Nebr., 1915"	40 14 22.6	96 00 35.0	7,892

Magnetic declination for east border of south half of quadrangle, 9° 15′ E.

OKLAHOMA.

PRIMARY TRAVERSE.

Foraker quadrangle.

OSAGE COUNTY.

The following geographic positions were determined from primary traverse by E. L. McNair, topographer, in 1914, and are based upon triangulation station Flint, established in 1897 by C. F. Urquhart. The position of this station on approximate North American datum is latitude 36° 44′ 05.85″; longitude 96° 33′ 17.45″. (For description see Bulletin 175.)

FORAKER QUADRANGLE.

Along section lines from Flint triangulation station north and east to point near southeast corner of quadrangle, thence north along east border to center of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 26 N., R. 7 E., corner of secs. 3, 4, 9, and 10, U. S. Land Survey; iron rod and cap	36 45 12.2	96 32 46.3	
T. 26 N., R. 7 E., ¼ corner between secs. 3 and 10, U. S. Land Survey; iron rod and cap	36 45 12.0	96 32 13.9	2,638
T. 26 N., R. 7 E., corner secs. 2, 3, 10, and 11, U. S. Land Survey; iron rod and cap	36 45 11.7	96 31 41.4	2,642
T. 26 N., R. 7 E., ¼ corner between secs. 2 and 3, U. S. Land Survey; iron rod and cap	36 45 11.4	96 31 09.0	2,635
T. 26 N., R. 7 E., corner secs. 1, 2, 11, and 12	36 45 11.7	96 30 36.8	2,625
T. 26 N., R. 7 E., ¼ corner between secs. 1 and 2	36 45 37.4	96 30 36.9	2,600
Tps. 26 and 27, N., R. 7 E., corner secs. 1, 2, 35, and 36, U. S. Land Survey; iron rod and cap	36 46 04.7	96 30 36.7	2,760
T. 27 N., R. 7 E., corner secs. 25, 26, 35, and 36, U. S. Land Survey; iron rod and cap	36 46 58.0	96 30 37.3	5,394
T. 27 N., R. 7 E., ¼ corner secs. 25 and 26	36 47 22.2	96 30 37.2	2,439
T. 27 N., R. 7 E., corner secs. 23, 24, 25, and 26, U. S. Land Survey; iron rod and cap	36 47 48.0	96 30 37.4	2,615
T. 27 N., R. 7 E., corner secs. 13, 14, 23, and 24, U. S. Land Survey; iron rod and cap	36 48 39.8	96 30 37.7	5,230
T. 27 N., R. 7 E., ¼ corner between secs. 13 and 14; iron rod and cap.	36 49 05.9	96 30 37.9	2,640
T. 27 N., R. 7 E., corner secs. 11, 12, 13, and 14, U. S. Land Survey; iron rod and cap	36 49 31.9	96 30 38.0	2,635
T. 27 N., R. 7 E., corner secs. 1, 2, 11, and 12, U. S. Land Survey; iron rod and cap	36 50 23.9	96 30 38.2	5,257
T. 27 N., R. 7 E., ¼ corner secs. 1 and 2, U. S. Land Survey; iron rod and cap	36 50 50.2	96 30 38.3	2,659
Tps. 27 and 28 N., R. 7 E., corner secs. 1, 2, 35, and 36, near creek and road east and west, 50 feet south of fence (no post found)	36 51 17.8	96 30 38.3	2,790
T. 28 N., R. 7 E., ¼ corner between secs. 35 and 36	36 51 43.9	96 30 38.2	2,640
T. 28 N., R. 7 E., corner secs. 25, 26, 35, and 36, U. S. Land Survey; iron rod and cap	36 52 09.8	96 30 38.5	2,613

Along section lines through center of quadrangle.

Foraker, 3 miles east of; 168 feet north by 106 feet west of corner of secs. 25, 26, 35, and 36, T. 28 N., R. 7 E., 20 feet north of center of road, 4 feet north of wire fence; iron post stamped "Prim. Trav. Sta. No. 1, 1914, elev. 1,218"	36 52 10.8	96 30 40.5	199
T. 28 N., R. 7 E., ¼ corner between secs. 26 and 35, center of road at north and south fence (no rod)	36 52 09.5	96 31 10.8	2,461
T. 28 N., R. 7 E., corner secs. 26, 27, 34, and 35, in center of east and west road, at north and south fence line (no iron rod found)	36 52 09.3	96 31 43.1	2,624
T. 28 N., R. 7 E., ¼ corner between secs. 27 and 34 (no mark)	36 52 09.4	96 32 15.3	2,615

FORAKER QUADRANGLE—Continued.

Along section lines through center of quadrangle—Continued

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 28 N., R. 7 E., corner secs. 27, 28, 33, and 34, at T road south, U. S. Land Survey; iron rod and cap	36 52 09.6	96 32 47.8	2,640
T. 28 N., R. 7 E., ¼ corner between secs. 28 and 33	36 52 09.3	96 33 20.4	2,650
T. 28 N., R. 7 E., corner secs. 28, 29, 32, and 33, 4 feet south of Foraker railway station at roads north, south, and west, U. S. Land Survey; iron rod and cap	36 52 07.8	96 33 53.0	2,659
T. 28 N., R. 7 E., corner secs. 29, 30, 31, and 32, (no mark found), fence and road south apparently not on the line	36 52 07.8	96 34 58.0	5,279
T. 28 N., R. 7 E., ¼ corner between secs. 30 and 31	36 52 07.5	96 35 30.5	2,640
T. 28 N., Rs. 6 and 7 E., corner secs. 30, 31, 25, and 36, U. S. Land Survey; iron rod and cap	36 52 07.4	96 35 57.0	2,150
T. 28 N., R. 6 E., ¼ corner between secs. 25 and 36	36 52 07.5	96 36 29.5	2,645
T. 28 N., R. 6 E., corner secs. 35, 36, 25, and 26, U. S. Land Survey; iron rod and cap	36 52 07.6	96 37 02.1	2,651
T. 28 N., R. 6 E., ¼ corner between secs. 26 and 35	36 52 07.6	96 37 34.6	2,634
T. 28 N., R. 6 E., 1,590 feet west of ¼ corner between secs. 26 and 35; iron post stamped "elev. 1217"	36 52 07.6	96 37 54.1	1,590
T. 28 N., R. 6 E., corner secs. 26, 27, 34, and 35	36 52 07.6	96 38 07.0	1,044
T 28 N., R. 6 E., ¼ corner between secs. 27 and 34	36 52 07.7	96 38 39.5	2,643
T. 28 N., R. 6 E., corner secs. 27, 28, 33, and 34, U. S. Land Survey; iron rod and cap	36 52 07.8	96 39 12.1	2,645
T. 28 N., R. 6 E., corner secs. 28, 29, 32, and 33 (There is a U. S. A. S. bench mark at northeast corner of crossroads.)	36 52 07.8	96 40 16.9	5,270
T. 28 N., R. 6 E., ¼ corner secs. 29 and 32, U. S. Land Survey; iron rod	36 52 07.8	96 40 49.4	2,643
T. 28 N., R. 6 E., corner secs. 29, 30, 31, and 32, U. S. Land Survey; iron rod and cap	36 52 07.8	96 41 22.0	2,645
T. 28 N., R. 6 E., ¼ corner between secs. 30 and 31	36 52 07.8	96 41 54.3	2,629
T 28 N., Rs. 5 and 6 E., at T road south, corner secs. 25, 36, 30, and 31, U. S. Land Survey; iron rod	36 52 07.7	96 42 25.1	2,503
T. 28 N., R. 5 E., 1,833 feet west of east corner of secs. 25 and 36; iron post stamped "Elev. 1143"	36 52 07.6	96 42 47.8	1,837
T. 28 N., R. 5 E., ¼ corner between secs. 25 and 36	36 52 07.8	96 42 57.7	808
T. 28 N., R. 5 E., corner secs. 25, 26, 35, and 36	36 52 07.9	96 43 30.2	2,646

Along section lines near west border of quadrangle.

T. 28 N., R. 5 E., ¼ corner between secs. 35 and 36	36 51 41.9	96 43 30.6	2,632
Tps. 27 and 28 N., R. 5 E., corner secs. 35, 36, 1, and 2; iron post and cap	36 51 15.7	96 43 30.6	2,650
T. 27 N., R. 5 E., ¼ corner between secs. 1 and 2	36 50 49.2	96 43 30.7	2,682
T. 27 N., R. 5 E., corner secs. 1, 2, 11, and 12	36 50 23.0	96 43 30.9	2,644
T. 27 N., R. 5 E., ¼ corner between secs. 11 and 12	36 49 56.7	96 43 31.0	2,666
T. 27 N., R. 5 E., corner secs. 11, 12, 13, and 14	36 49 30.8	96 43 31.1	2,624
T. 27 N., R. 5 E., ¼ corner between secs. 13 and 14	36 49 04.7	96 43 31.1	2,637
T. 27 N., R. 5 E., corner secs. 13, 14, 23, and 24	36 48 38.6	96 43 31.1	2,638
T. 27 N., R. 5 E., ¼ corner between secs. 23 and 24	36 48 12.5	96 43 31.2	2,640
T. 27 N., R. 5 E., corner secs. 23, 24, 25, and 26	36 47 46.4	96 43 31.2	2,640
T. 27 N., R. 5 E., ¼ corner between secs. 25 and 26 (no post); indicated by road and fence	36 47 20.4	96 43 31.4	2,635
T. 27 N., R. 5 E., approximate corner between secs. 25, 26, 35, and 36; indicated by road west and fence east and south (no post)	36 46 54.3	96 43 31.4	2,640
T. 27 N., R. 5 E., ¼ corner between secs. 35 and 36	36 46 28.2	96 43 31.2	2,640
Tps. 26 and 27 N., R. 5 E., corner secs. 1, 2, 35, and 36, about 33 feet south of fence and 16 feet east of fence, U. S. Land Survey; iron rod and cap	36 46 02.1	96 43 31.5	2,638

Along section lines near south border of quadrangle from southwest corner to Flint triangulation station.

T. 27 N., R. 5 E., ¼ corner between secs. 1 and 36	36 46 02.1	96 42 59.2	2,630
Tps. 26 and 27 N., Rs. 5 and 6 E., at corner of township, U. S. Land Survey; iron post	36 46 02.2	96 42 26.8	2,630
Tps. 26 and 27 N., R. 6 E., ¼ corner between secs. 6 and 31	36 46 02.0	96 41 53.8	2,687
Tps. 26 and 27 N., R. 6 E., corner of secs. 5, 6, 31, and 32, U. S. Land Survey; iron rod and cap	36 46 01.9	96 41 21.6	2,626
Tps. 26 and 27 N., R. 6 E., corner of secs. 4, 5, 32, and 33, U. S. Land Survey; iron rod and cap	36 46 02.1	96 40 16.8	5,272
Tps. 26 and 27 N., R. 6 E., ¼ corner secs. 4 and 33	36 46 02.1	96 39 44.3	2,640
Tps. 26 and 27 N., R. 6 E., corner secs. 3, 4, 33, and 34, U. S. Land Survey; iron rod and cap	36 46 02.1	96 39 11.9	2,640

FORAKER QUADRANGLE—Continued.

Along section lines near south border of quadrangle from southwest corner of Flint triangulation station—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Tps. 26 and 27 N., R. 6 E., ¼ corner between secs. 2 and 35, U. S. Land Survey; iron rod at fence corner	36 46 02.3	96 37 34.6	7,913
Tps. 26 and 27 N., R. 6 E., corner of secs. 1, 2, 35, and 36, U. S. Land Survey; iron rod and cap	36 46 02.4	96 37 02.2	2,640
Tps. 26 and 27 N., R. 6 E., ¼ corner between secs. 1 and 36	36 46 02.5	96 36 29.8	2,640
Tps. 26 and 27 N., Rs. 6 and 7 E., township corner U. S. Land Survey; iron post	36 46 02.6	96 35 57.3	2,640
T. 26 N., Rs. 6 and 7 E., ¼ corner between secs. 1 and 6	36 45 36.5	96 35 57.3	2,644
T. 26 N., Rs. 6 and 7 E., corner secs. 1, 6, 7, and 12, U. S. Land Survey; iron rod and cap	36 45 10.5	96 35 57.2	2,628
T. 26 N., R. 7 E., ¼ corner between secs. 6 and 7	36 45 10.6	96 35 28.2	2,366
T. 26 N., R. 7 E., corner secs. 5, 6, 7, and 8, U. S. Land Survey; iron rod and cap	36 45 10.8	96 34 55.6	2,654
T. 26 N., R. 7 E., ¼ corner between secs. 5 and 8	36 45 10.9	96 34 23.0	2,650
T. 26 N., R. 7 E., corner secs. 4, 5, 8, and 9, U. S. Land Survey; iron rod and cap	36 45 11.1	96 33 50.4	2,654
Along section lines near east border of quadrangle.			
T. 28 N., R. 7 E., ¼ corner between secs. 25 and 26	36 52 35.5	96 30 38.7	2,610
T. 28 N., R. 7 E., corner of secs. 23, 24, 25, and 26, U. S. Land Survey; iron rod and cap	36 53 01.1	96 30 38.3	2,590
T. 28 N., R. 7 E., ¼ corner between secs. 23 and 24	36 53 27.4	96 30 38.1	2,660
T. 28 N., R. 7 E., corner secs. 13, 14, 23, and 24, U. S. Land Survey; iron rod and cap	36 53 53.7	96 30 38.0	2,659
T. 28 N., R. 7 E., ¼ corner between secs. 13 and 14	36 54 19.8	96 30 37.8	2,647
T. 28 N., R. 7 E., corner secs. 11, 12, 13, and 14, U. S. Land Survey; iron rod and cap	36 54 46.0	96 30 37.6	2,653
T. 28 N., R. 7 E., ¼ corner between secs. 11 and 12	36 55 12.3	96 30 37.6	2,660
T. 28 N., R. 7 E., corner secs. 1, 2, 11, and 12, U. S. Land Survey; iron rod and cap	36 55 38.6	96 30 37.5	2,670
T. 28 N., R. 7 E., ¼ corner between secs. 1 and 2	36 56 04.6	96 30 37.3	2,630
T. 28 N., R. 7 E., closing corner of secs. 1 and 2, U. S. Land Survey; iron rod and cap	36 56 31.2	96 30 37.0	2,685
T. 29 N., R. 7 E., standard corner of secs. 35 and 36, U. S. Land Survey; iron rod and cap	36 56 30.8	96 30 25.3	951
T. 29 N., R. 7 E., ¼ corner between secs. 35 and 36	36 56 56.6	96 30 25.0	2,615
T. 29 N., R. 7 E., corner of secs. 25, 26, 35, and 36	36 57 22.7	96 30 24.7	2,640
T. 29 N., R. 7 E., ¼ corner secs. 25 and 26	36 57 48.6	96 30 24.4	2,625
T. 29 N., R. 7 E., corner secs. 23, 24, 25, and 26	36 58 14.6	96 30 24.2	2,635
T. 29 N., R. 7 E., ¼ corner between secs. 23 and 24	36 58 40.4	96 30 23.9	2,610
T. 29 N., R. 7 E., corner secs. 13, 14, 23, and 24	36 59 06.4	96 30 23.6	2,629
T. 29 N., R. 7 E., ¼ corner between secs. 13 and 14; pile of stones mark	36 59 32 6	96 30 22.6	2,652
Along Kansas-Oklahoma State line near north border of quadrangle.			
T. 29 N., R. 7 E., closing corner north side of secs. 14 and 15, in east and west fence line, east of creek bed, U. S. Land Survey; iron rod and cap	36 59 56.7	96 31 28.0	5,843
T. 29 N., R. 7 E., closing corner north side of secs. 15 and 16, U. S. Land Survey; iron rod and cap	36 59 56.4	96 32 32.8	5,251
T. 29 N., R. 7 E., closing corner north side of secs. 16 and 17, U. S. Land Survey; iron rod and cap	36 59 56.4	96 33 38.0	5,290
T. 29 N., R. 7 E., closing corner north side of secs. 17 and 18, U. S. Land Survey; iron rod and cap	36 59 56.4	96 34 43.7	5,334
T. 29 N., Rs. 6 and 7 E., closing corner north side secs. 13 and 18	36 59 56.5	96 35 49.2	5,312
T. 29 N., R. 6 E., closing corner north side of secs. 13 and 14, U. S. Land Survey; iron rod and cap	36 59 56.4	96 36 53.8	5,242
T. 29 N., R. 6 E., closing corner north side of secs. 14 and 15	36 59 56.3	96 37 58.7	5,267
T. 29 N., R. 6 E., closing corner north side secs. 15 and 16	36 59 56.4	96 39 04.0	5,299
T. 29 N., R. 6 E., closing corner north side of secs. 16 and 17	36 59 56.4	96 40 08.9	5,264
T. 29 N., R. 6 E., closing corner north side secs. 17 and 18	36 59 55.7	96 41 13.4	5,232
T. 29 N., Rs. 5 and 6 E., closing corner north side of secs. 13 and 18	36 59 56.4	96 42 17.9	5,233
T. 29 N., R. 5 E., closing corner north side of secs. 13 and 14	36 59 56.3	96 43 22.6	5,248

FORAKER QUADRANGLE—Continued.

Along section lines near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 29 N., R. 5 E., ¼ corner between secs. 13 and 14	36 59 30.8	96 43 22.7	2,583
T. 29 N., R. 5 E., corner secs. 13, 14, 23, and 24	36 59 04.7	96 43 22.7	2,638
T. 29 N., R. 5 E., ¼ corner between secs. 23 and 24	36 58 38.6	96 43 22.8	2,639
T. 29 N., R. 5 E., corner secs. 23, 24, 25, and 26	36 58 12.4	96 43 22.9	2,640
T. 29 N., R. 5 E., ¼ corner between secs. 25 and 26	36 57 46.4	96 43 23.0	2,635
T. 29 N., R. 5 E., corner secs. 25, 26, 35, and 36	36 57 20.3	96 43 23.0	2,635
T. 29 N., R. 5 E., ¼ corner between secs. 35 and 36	36 56 54.1	96 43 23.1	2,640
T. 29 N., R. 5 E., standard corner secs. 35 and 36	36 56 28.0	96 43 23.2	2,645
T. 28 N., R. 5 E., ¼ corner north side of sec. 1 (no iron post)	36 56 28.0	96 42 56.8	2,147
T. 28 N., R. 5 E., ¼ corner between secs. 1 and 12, in east and west road, U. S. Land Survey; iron rod and cap	36 55 37.1	96 42 57.0	5,150
T. 28 N., R. 5 E., ¼ corner between secs. 12 and 13, U. S. Land Survey; iron rod and cap	36 54 44.8	96 42 57.2	5,286
T. 28 N., R. 5 E., corner secs. 13, 14, 23, and 24	36 53 52.5	96 43 29.7	5,913
T. 28 N., R. 5 E., ¼ corner between secs. 23 and 24 in center of north and south road, U. S. Land Survey; iron rod and cap	36 53 26.5	96 43 29.8	2,625
T. 28 N., R. 5 E., corner secs. 23, 24, 25, and 26	36 53 00.2	96 43 29.9	2,650
T. 28 N., R. 5 E., ¼ corner between secs. 25 and 26 near schoolhouse	36 52 34.1	96 43 30.1	2,646
T. 28 N., R. 5 E., corner secs. 25, 26, 35, and 36 at crossroads, U. S. Land Survey; iron rod and cap	36 52 07.9	96 43 30.2	2,644

Magnetic declination for north border of quadrangle, 9.9° E.; for south border, 9.7° E.; for east border, 9.6° E.; for west border, 9.9° E.; for center, 9.7° E.

Bristow, Hominy, Kiefer, Mallon, and Nuyaka quadrangles.

CREEK, OKMULGEE, AND TULSA COUNTIES.

The following geographic positions for the control of the north half of the Nuyaka 30′ quadrangle were obtained from primary traverse by C. B. Kendall in 1914. Positions are on approximate North American datum and are tied to Phantom, Philips, and Prairie triangulation stations described in Bulletin 175.

KIEFER QUADRANGLE.

Along public road from Philips triangulation station via Tabor and Kellyville to Blue Bell schoolhouse.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Tps. 15 and 16 N., R. 10 E., secs. 3, 4, 33, and 34, crossroads at corner of	35 48 48.1	96 14 44.3	
T. 16 N., R. 10 E., secs. 27, 28, 33, and 34, crossroads at corner of	35 49 40.4	96 14 44.1	5,290
T. 16 N., R. 10 E., secs. 26, 27, 34, and 35, road turns north at corner of	35 49 40.3	96 13 40.0	5,280
T. 16 N., R. 10 E., secs. 22, 23, 26, and 27, crossroads at corner of	35 50 32.7	96 13 40.1	5,297
T. 16 N., R. 10 E., secs. 14, 15, 22, and 23, corner of	35 51 25.2	96 13 40.0	5,308
T. 16 N., R. 10 E., secs. 10, 11, 14, and 15, 20 feet north and 20 feet west of corner of; at corner of wire fence in northwest corner of road intersection; iron post stamped "Prim. Trav. Sta. No. 10, 1914"	35 52 17.7	96 13 40.0	5,319
T. 16 N., R. 10 E., secs. 2, 3, 10, 11, T road east at corner of	35 53 10.0	96 13 39.2	5,288
T. 16 N., R. 10 E., secs. 2, 3, closing corner on north side of	35 54 04.4	96 13 38.8	5,501
T. 17 N., R. 10 E., secs. 34, 35, corner on south side of, at T road north	35 54 04.4	96 13 33.5	440
T. 17 N., R. 10 E., secs. 26, 27, 34, and 35, T road west at corner of	35 54 56.6	96 13 33.4	5,282
Polecat Creek, center of, steel bridge over	35 55 18.5	96 13 31.8	2,212
Elevated gas tank, top of	35 55 55.0	96 13 52.6	4,073
T. 17 N., R. 10 E., corner of secs. 22, 23, 26, and 27	35 55 48.8	96 13 33.3	1,708
St. Louis & San Francisco Ry., at north-south highway crossing	35 56 14.4	96 13 33.1	2,584
Kellyville, public road crossing "Frisco" R. R. main track at	35 56 36.8	96 13 09.3	3,001
Kellyville railway station, 20 feet west and 150 feet south of; in sandstone at northwest corner of wire fence, 150 feet south of railway, 50 feet east of highway; bronze tablet stamped "Prim. Trav. Sta. No. 11, 1914"	35 56 43.7	96 13 00.4	1,006
T. 17 N., R. 10 E., secs. 14, 15, 22, 23, crossroads at corner of	35 56 41.3	96 13 33.0	2,688
T. 17 N., R. 10 E., corner of secs. 10, 11, 14, and 15	35 57 33.6	96 13 33.4	5,290
T. 17 N., R. 10 E., secs. 2, 3, 10, and 11, crossroads at corner of	35 58 26.0	96 13 33.1	5,298

KIEFER QUADRANGLE—Continued.

Along public road from Philips triangulation station via Taber and Kellyville to Blue Bell schoolhouse—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Blue Bell schoolhouse, 3 miles north of Kellyville, in northwest corner of crossroads, 25 feet north and 25 feet west of corner of secs. 2, 3, 34, and 35, T. 17 and 18 N., R. 10 E.; iron post stamped "Prim. Trav. Sta. No. 2, 1914"	35 59 19.0	96 13 33.4	5,362
Along public highways near north border of quadrangle.			
Tps. 17 and 18 N., R. 10 E., secs. 3, 4, 33, and 34, crossroads at corner of	35 59 18.7	96 14 37.4	5,260
Tps. 17 and 18 N., R. 10 E., corner of secs. 1, 2, 35, and 36, near second-class T road north	35 59 18.7	96 12 28.2	.....
Plane-table flag on southeast end of bare hill	35 58 56.3	96 11 42.7	4,372
Tps. 17 and 18 N., Rs. 10 and 11 E., secs. 1, 6, 31, and 36, second-class T road south, at corner of	35 59 18.6	96 11 24.0	2,734
T. 18 N., R. 11 E., quarter corner between secs. 31 and 32, in east and west road, at wire fence south	35 59 44.8	96 10 20.2	5,880
Sapulpa, 3 miles west of, north and south highway crossing St. Louis & San Francisco Ry	35 59 37.1	96 09 46.7	2,859
Tps. 17 and 18 N., R. 11 E., corner of secs. 4, 5, 32, and 33, corner of wire fence is 25 feet south	35 59 18.7	96 09 16.0	3,142
Tps. 17 and 18 N., R. 11 E., secs. 3, 4, 33, and 34, T road south at corner of	35 59 18.7	96 08 11.5	5,300
Rock Creek, center of iron bridge over	35 59 17.8	96 07 39.2	2,665
Tps. 17 and 18 N., R. 11 E., secs. 2, 3, 34, and 35, crossroads at corner of	35 59 18.6	96 07 07.2	2,630
Sapulpa, at southwest corner Main and Hobson streets, on east side of Ripley Hotel, 4 feet above sidewalk and 4 feet south of northeast corner of building; bench-mark tablet stamped "Prim. Trav. Sta. No. 1, elev. 723"	35 59 58.6	96 06 51.3	4,255
Sapulpa, in top of east buttress stone between lamp post and face of wall at main entrance to the Creek County courthouse; bench-mark tablet stamped "Prim. Trav. Sta. No. 12, 1914, elev. 712"	35 59 54.7	96 06 37.2	1,222
Sapulpa, center of street-car track and "Frisco" Ry. crossing on Dewey Avenue	35 59 56.2	96 06 16.7	1,696
Tps. 17 and 18 N., Rs. 11 and 12 E., secs. 1, 6, 31, and 36, at corner of and at T road south, 250 feet west of iron bridge over Polecat Creek; iron post stamped "Prim. Trav. Sta. No. 13, 1914," in addition to its land markings	35 59 18.6	96 04 58.7	7,448
Tps. 17 and 18 N., R. 12 E., secs. 5, 6, 31, and 32, cross roads at corner of	35 59 18.5	96 03 54.5	5,280
Tps. 17 and 18 N., R. 12 E., secs. 4, 5, 32, and 33, crossroads near top of hill about 200 feet east of	35 59 18.4	96 02 47.9	5,477
Tps. 17 and 18 N., R. 12 E., secs. 3, 4, 33, and 34, 40 feet north and 20 feet west of approximate corner of, inside corner of wire fence around Prairie Oil & Gas Co.'s pumping plant, in northwest corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 14, 1914"	35 59 18.8	96 01 45.9	5,095
Prairie triangulation station; Sapulpa, 5 miles east of, on a prairie knob, the corner common to secs. 9, 10, 15, and 16, T. 17 N., R. 12 E.; may be reached from station by going east 28.30 chains to north-south line, thence south 41.54 chains; iron bench mark post	35 58 00.4	96 02 08.0	8,132
T. 17 N., R. 12 E., corner of secs. 9, 10, 15, and 16	35 57 33.3	96 01 45.2	3,318

Magnetic declination for north border of quadrangle, 9° 23′ E.; for west border, 9° 48′ E.

BRISTOW QUADRANGLE.

Along public roads from Philips triangulation station via Tabor and Kellyville to Blue Bell schoolhouse, near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 15 N., R. 10 E., secs. 17, 18, 19, and 20, crossroads at corner of	35 46 10.8	96 16 52.6	.....
Deep Fork Creek, center of iron bridge over	35 46 10.0	96 16 13.9	3,190
T. 15 N., R. 10 E., corner of secs. 8, 9, 16, 17, 35 feet south and 30 feet west at corner of wire fence in southwest corner of intersection of crossroads; iron post stamped "Prim. Trav. Sta. No. 9, 1914"	35 47 02.9	96 15 48.7	5,737
T. 15 N., R. 10 E., corner secs. 4, 5, 8, and 9	35, 47 55.6	96 15 48.3	5,334
Tps. 15 and 16, R. 10 E., secs. 4, 5, 32, and 33, crossroads at corner of	35 48 48.1	96 15 48.5	5,310

BRISTOW QUADRANGLE—Continued.

Near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Tps. 17 and 18 N., R. 10 E., at corner of secs. 4, 5, 32, and 33, second-class T road north	35 59 18.8	96 15 41.9	.....
Tps. 17 and 18 N., R. 10 E., corner of secs. 5, 6, 31, and 32, stone is in center of old road 10 feet south of fence corner and about 450 feet east of gate across present road	35 59 18.8	96 16 47.3	5,376
Tps. 17 and 18 N., R. 9 E., secs. 1 and 36, ¼ corner between, at corner T wire fence and 225 feet south of gate	35 59 20.7	96 18 23.4	7,900
Tps. 17 and 18, R. 9 E., corner secs. 1, 2, 35, and 36, at wire fence south	35 59 19.2	96 18 55.7	2,656
Brown Creek, center of iron bridge over	35 59 19.2	96 19 33.0	3,066
Tps. 17 and 18 N., R. 9 E., corner of secs. 2, 3, 34, and 35, 900 feet west of top of hill	35 59 19.0	96 19 59.7	2,195
Tps. 17 and 18 N., R. 9 E., corner of secs. 3, 4, 33, and 34, at wire fence north and south	35 59 19.1	96 21 04.4	5,320
Tps. 17 and 18 N., R. 9 E., secs. 4, 5, 32, and 33, 20 feet south and 20 feet east of corner of, at corner of wire fence in the southeast corner of T road east; iron post stamped "Prim. Trav. Sta. No. 3, 1914"	35 59 18.8	96 22 08.4	5,261
T. 18 N., R. 9 E., secs. 32 and 33, second-class T road east at, ¼ corner between	35 59 45.0	96 22 08.8	2,652
Polecat Creek, center of iron bridge over	35 59 56.1	96 28 34.9	.....
Tps. 17 and 18 N., R. 8 E., corner secs 4, 5, 32, and 33, center of second-class road east	35 59 18.7	96 28 34.9	3,780
T. 17 N., R. 8 E., corner of secs. 4, 5, 8, and 9, center of crossroads	35 58 26.9	96 28 35.4	5,300
T. 17 N., R. 8 E., corner secs. 8, 9, 16, and 17, at second-class T road west	35 57 33.9	96 28 35.4	5,310
T. 17 N., R. 8 E., corner of secs. 16, 17, 20, and 21, at crossroads	35 56. 41.5	96 28 35.4	5,300
T. 17 N., R. 8 E., corner of secs. 20, 21, 28, and 29, is 50 feet east of road and 35 feet southwest of corner of wire fence	35 55 49.0	96 28. 35.3	5,300
T. 17 N., R. 8 E., corner of secs. 28, 29, 32, and 33, in meadow on top of small hill and 400 feet north of forks at corner of fence	35 54 56.8	96 28 35.4	5,280
T. 16 N., R. 8 E., near north corner of secs. 4 and 5, center of east-west road and 25 feet east of T road north (25 feet west of above is south corner secs. 32, and 33, T. 17 N., R. 8 E., at T road north.)	35 54 04.3	96 28 35.3	5,308
T. 17 N., R. 8 E., south corner of secs. 31 and 33, stone is 10 feet northwest of corner of wire fence (25 feet east of above is north corner of secs. 5 and 6, T. 16 N., R. 8 E.)	35 54 04.4	96 29 40.1	5,330

Near south border of quadrangle.

T. 15 N., R. 8 E., corner of secs. 7, 8, 17, and 18, 15 feet west of cross-roads	35 47 03.9	96 29 39.4	.....
T. 15 N., R. 8 E., corner of secs. 8, 9, 16, and 17, at crossroads	35 47 03.8	96 28 35.0	5,304
T. 15 N., R. 8 E., corner of secs 9, 10, 15, and 16, at crossroads	35 47 04.2	96 27 30.5	5,310
T. 15 N., R. 8 E., corner of secs. 10, 11, 14, and 15, at second-class T road north	35 47 04.4	96 26 26.4	5,285
T. 15 N., R. 8 E., corner of secs. 11, 12, 13, 14, at T road east	35 47 05.0	96 25 21.9	5,314
T. 15 N., R. 8 E., corner of secs. 13, 14, 23, and 24, 25 feet south of crossroads	35 46 12.7	96 25 22.2	5,293
T. 15 N., Rs. 8 and 9 E., corner of secs. 13, 18, 19, and 24, at cross-roads	35 46 12.8	96. 24 17.9	5,297
T. 15 N., R. 9 E., corner of secs, 17, 18, 19, 20, 20 feet south and 20 feet east of wire fence in southeast corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 8, 1914"	35 46 12.0	96 23 12.9	5,360
T. 15 N., R. 9 E., corner of secs. 16, 17, 20, and 21, in east and west road 30 feet north of crossroads	35 46 11.8	96 22 09.3	5,240
T. 15 N., R. 9 E., corner of secs, 20 21, 28, and 29, at crossroads	35 45 19.7	96 22 09.2	5,270
T. 15 N., R. 9 E., corner of secs. 21, 22, 27, and 28, 10 feet northeast of crossroads	35 45 19.1	96 21 05.3	5,275
T. 15 N., R. 9 E., corner of secs. 22, 23, 26, and 27, at crossroads	35 45 18.8	96 20 01.1	5,286
T. 15 N., R. 9 E., corner of secs. 23, 24, 25, and 26, in pasture 25 feet north of road	35 45 18.3	96 18 57.1	5,280

Magnetic declination near north border of quadrangle, 9° 43′ E; near east border, 9° 42′ E.; near west border, 9° 45′ E.; near south border, 9° 34′ E.

NUYAKA QUADRANGLE.

Near Philips triangulation station.

Station.	Latitude.	Longitude.	Distance between stations.
Philips triangulation station, on the highest point of a ridge 2½ miles southwest of Philipsburg; theodolite elevated 35 feet; station mark: Rock marked $\frac{U\ S}{G\ S}$ +. In 1914 Kendall determined this station to be 3,134 feet south and 2,472 feet east of corner of secs. 23, 24, 25, and 26, T. 15 N., R. 9 E. Original stone station mark was removed and a standard iron bench-mark post placed with center of same as the original mark	° ′ ″ 35 44 47.3	° ′ ″ 96 18 27.1	*Feet.* .....
T. 15 N., Rs. 9 and 10 E., corner of secs. 25, 30, 31, and 36. (Recomputed from sta. 339 not 338)	35 44 25.7	96 17 52.9	3,576
T. 15 N., R. 10 E., corner stone of secs. 29, 30, 31, and 32	35 44 25.7	96 16 52.6	4,978

Magnetic declination near north border of southwest quarter of quadrangle, 9° 34′ E.

HOMINY QUADRANGLE.

Near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
T. 18 N., R. 9 E., corner of secs. 29, 30, 31, 32, 1,150 feet west of top of hill	° ′ ″ 36 00 11.6	° ′ ″ 96 23 13.1	*Feet.* .....
T. 18, N., Rs. 8 and 9 E., corner of secs. 25, 30, 31, and 36, in northwest corner of T road north	36 00 11.4	96 24 17.4	5,281
T. 18 N., R. 8 E., corner of secs. 25 26, 35, and 36	36 00 11.3	96 25 21.8	5,295
T. 18 N., R. 8 E., corner of secs. 26, 27, 34, and 35, at second-class crossroad	36 00 11.2	96 26 26.2	5,290
Scholar Creek, center of iron bridge over	36 00 11.0	96 26 56.0	2,450
T. 18 N., R. 8 E., corner of secs. 27, 28, 33, and 34, 10 feet northeast of crossroads	36 00 10.9	96 27 30.5	2,830
Happy Corner Church, 250 feet west of, in southwest corner of crossroads, 10 feet north and 12 feet west of T. 18 N., R. 8 E., stone corner secs. 28, 29, 32, and 33; iron post stamped "Prim. Trav. Sta. No. 4, 1914"	36 00 10.9	96 28 35.0	5,305

Near east border of southwest quadrangle.

T. 18 N., R. 10 E., corner of secs. 16, 17, 20, and 21, at T fence east, 820 feet south of gate across main road	36 01 56.2	96 15 41.8	.....
Phantom triangulation station, on the highest part of a timbered ridge 15 miles from Red Fork, 5 miles southwest of Mr. Rockhammer's house. The corner common to secs. 7, 8, 17, and 18, T. 18 N., R. 10 E., may be reached from station by going west 24.90 chains to north-south line, thence south 2.25 chains. Theodolite elevated 40 feet. Station mark: Rock marked $\frac{U\ S}{G\ S}$ + remarked with standard iron post	36 02 49.8	96 16 27.2	6,577

Magnetic declination near south border of quadrangle, 9° 43′ E.

Near west border of southeast quarter of quadrangle.

Blue Bell schoolhouse, 1 mile north of double oak tree at crossroads, H. W. Doty and Little's mail boxes	36 00 07.6	96 13 33.0	.....
T. 18 N., R. 10 E., corner of secs. 26, 27, 34, and 35, 40 feet east of road, 15 feet south of corner of wire fence, and about 400 feet north of crossroads	36 00 11.3	96 13 33.0	370
T. 18 N., R. 10 E., corner of secs, 22, 23, 26, and 27, in center of road between two pipe and telephone lines and 250 feet south of T road east	36 01 03.5	96 13 32.9	5,287
T. 18 N., R. 10 E., ¼ corner between secs. 22 and 23, 4 corners 480 feet north of	36 01 35.5	96 13 32.8	3,230
Sapulpa, 8 miles northwest of, 250 feet north of Sapulpa and Cushing automobile road, chimney of stone house	36 01 45.4	96 14 05.9	2,898
T. 18 N., R. 10 E., corner of secs. 15, 16, 22, 21, at second-class road north and bend of main road to west	36 01 55.8	96 14 37.3	2,782

Magnetic declination near west border of southeast quarter of quadrangle 9° 41′ E.

MALLON QUADRANGLE.

Near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. 16 N., Rs. 7 and 8 E., secs. 1 and 6, north corner of; iron post stamped with land numbers, also elevation 958, "Prim. Trav. Sta. No. 5, 1914" (112 feet west of this station is standard iron post, stamped with land numbers for T. 17 N., Rs. 7 and 8 E., secs. 31 and 36, north corner)	35 54 04.4	96 30 43.0	
T. 16 N., Rs. 7 and 8 E., corner of secs. 1, 6, 7, 12	35 53 10.3	96 30 43.2	5,472
T. 16 N., Rs. 7 and 8 E., corner of secs. 7, 12, 13, and 18, at second-class T road west, 200 feet north to house	35 52 17.9	96 30 43.1	5,300
T. 16 N., Rs. 7 and 8 E., corner of secs. 13, 18, 19, and 24, at north end of bridge over small stream	35 51 25.7	96 30 43.4	5,280
T. 16 N., Rs. 7 and 8 E., near corner of secs. 19, 24, 25, and 30, 10 feet west of east end of bridge over small stream	35 50 33.0	96 30 43.6	5,332
T. 16 N., Rs. 7 and 8 E., corner of secs. 25, 30, 31, and 36, at cross-roads 25 feet north to plank bridge	35 49 40.8	96 30 43.7	5,270
Tps. 15 and 16 N., Rs. 7 and 8 E., corner of secs. 1, 6, 31, and 36, 500 feet north of bridge over Little Deep Fork Creek and ¾ mile northwest of Depew; iron bench-mark post with land marks, also stamped "Prim. Trav. Sta. No. 6, 1914, elev. 815"	35 48 48.4	96 30 43.8	5,305
Little Deep Fork, center of iron bridge over, near T road west	35 48 42.4	96 30 43.7	608
T. 15 N., Rs. 7 and 8 E., quarter corner between secs. 1 and 6, at T road north	35 48 22.2	96 30 43.8	2,043
Depew, town pump at cross streets	35 48 10.9	96 30 26.4	1,835
T. 15 N., Rs. 7 and 8 E., center of secs. 1, 6, 7, 12, bridge over gully near corner of, southwest corner of Depew	35 47 55.2	96 30 43.6	2,130
T. 15 N., Rs. 7 and 8 E., 30 feet south and 25 feet east of corner of secs. 7, 12, 13, and 18, at corner of wire fence in southeast corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 7, 1914"	35 47 03.4	96 30 43.3	5,240

Magnetic declination near east border of quadrangle, 9° 42′ E.

NEVADA.

TRIANGULATION STATIONS.

Wabuska, Wellington, and Yerington quadrangles.

LYON COUNTY.

During the field season of 1913 triangulation was extended over part of Lyon County, Nev., in the Wabuska and Wellington 30′ quadrangles for control of the Yerington 7½′ quadrangle. The old stations Como and Mount Wilson were occupied and the scheme tied by unclosed triangles to Cleaver Peak and Desert Creek Peak. A least-square adjustment was made including the unoccupied points Cleaver and Desert Creek Peak. Observations and computations were made by R. H. Chapman.

The following positions are computed upon approximate North American datum, accepting the azimuth and distance Como-Mount Wilson given in Bulletin 122, page 336.

BUCKSKIN GALLOWS FRAME, LYON COUNTY, NEV. (Not occupied.)

Gallows frame of Kennedy Consolidated shaft at town of Buckskin.
Station mark: Middle of frame.

[Latitude, 38° 59′ 33.07″. Longitude, 119° 21′ 05.08″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Wishart	249 00 49	69 03 16	3.77862	3.73
Mickey	273 44 43	93 48 47	3.97087	5.81
Packhorse	314 22 38	134 26 04	4.04277	6.86
Wilson	323 51 55	143 56 45	4.28786	12.06

CARSON HILL, LYON COUNTY, NEV.

On highest of brick-red knolls 6 miles northwest of Yerington and 7 miles southwest of Wabuska. Station is about 0.5 mile north of Yerington–Mason Pass road, 1 mile north of West End mine, and 1 mile east of Ironside shaft.

Signal: Tripod 4.5 feet high, black and white cloth.

Station mark: Neck of bottle on end 10 inches below surface, over which is bronze tablet cemented in rock 18 by 14 by 8 inches.

Reference marks: Tack in peg, 11.2 feet south of center in true azimuth 4° 58′; tack in peg 14.25 feet west of center in true azimuth 100° 01′; wheel on frame of Ironside shaft, about 1 mile west, in true azimuth 100° 14′.

[Latitude, 39° 03′ 31.96″. Longitude, 119° 14′ 12.42″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Mickey	4 18 15.41	184 17 59.69	3.9033867	4.974
Wishart	39 38 07.56	219 36 14.46	3,8307836	4.209
Thompson Smelter	193 33 21	13 34 34	4.06590	7.23
Cleaver Peak	206 49 13.4	26 53 09.5	4.2989780	12.369
Luhr	317 49 37.83	137 53 31.81	4.1247560	8.281
Yerington water tank	319 54 55	139 57 51	4.01931	6.50
Yerington courthouse	321 29 09	141 31 57	4.01287	6.40

CLEAVER, LYON COUNTY, NEV. (Not occupied.)

Station is often called Wabuska Hill; a bare, rocky, flat-topped peak, 6 miles east of north of the town of Wabuska, in Lyon County, Nev.

Station mark: A cairn 8 feet high.

[Latitude, 39° 13′ 07.85″. Longitude, 119° 07′ 58.02″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Luhr	0 08 06.3	180 08 04.7	4.4415672	17.176
Wilson	10 27 47.0	190 24 30.2	4.6179583	25.782
Mickey	20 28 44.6	200 24 32.82	4.4388988	17.071
Carson Hill	26 53 09.5	206 49 13.4	4.2989780	12.369
Como	53 28 44.8	233 15 51.5	4.5645130	22.796
Como[a]	53 29 16	233 16 22	4.5645136	22.796

[a] Figures from Bulletin 122.

COMO, WASHOE COUNTY, NEV.

A station of the Coast and Geodetic Survey, on a high conical peak on Pinenut Mountains, about 20 miles nearly due east from town of Genoa, about 20 miles southeast from Carson City, and about 17 miles southeast from Dayton.

Station mark: Subsurface mark a one-half by 4 inch copper bolt leaded into a large and well-bedded granite rock. The surface mark a half-inch drill hole in center of large flat stone, 19 by 22 inches square and 5 inches thick, firmly cemented to top of stone and brick pier built over and around lower mark.

Reference marks: Two piers, one north and one south; drill holes were made in the rock, one in line to Round Top, distant 6.25 meters; one in line to north pier, distant 10.6 meters; and one in line to south pier, distant 7.24 meters from station.

[Latitude, 39° 01′ 18.060″. Longitude, 119° 28′ 23.621″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Cleaver Peak	233 15 51.5	53 28 44.8	4.5645130	22.796
Cleaver Peak[a]	233 16 22	53 29 16	4.5645136	22.796
Thompson Smelter	236 15 08	56 25 16	4.44497	17.31
Mickey	280 53 52.9	101 02 32.9	4.3064505	12.583
Packhorse	300 39 27.36	120 47 29.10	4.3314232	13.328
Mount Wilson[a]	310 37 13	130 46 47	4.4625328	18.025
Desert Creek Peak	343 02 19.5	163 08 16.7	4.6744206	29.361
Desert Creek Peak[a]	343 02 38	163 08 36	4.6744512	29.363

[a] Figures from Bulletin 122.

DESERT CREEK PEAK, LYON COUNTY, NEV. (Not occupied.)

A bare peak, the northernmost on the ridge between Desert Creek and the Carson-Aurora road. It is 3 miles south of Hall and Simpson's ranch.

Permanent mark: A rock monument.

[Latitude, 38° 36′ 51.98″ (38° 36′ 51.9″[a]). Longitude, 119° 18′ 53.78″ (119° 18′ 54.1″[a]).]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Como	163 08 16.7	343 02 19.5	4.6744206	29.361
Como[a]	163 08 36	343 02 38	4.6744512	29.363
Packhorse	187 51 25	7 53 28	4.5387706	21.484
Wilson	197 28 40.5	17 32 15.3	4.4404205	17.130
Wilson[a]	197 28 53	17 32 28	4.4405014	17.134

[a] Figures from Bulletin 122.

LUHR, LYON COUNTY, NEV.

On northern rocky hill, about 3.5 miles northeast of Mason and 2 miles southeast of Yerington. On first bluff east of and 400 feet above Walker River, about 0.8 mile southeast of the Luhr ranch, and 0.5 mile northeast of cemetery at foot of bluff.

Signal: Tripod 4.5 feet high, white cloth, centered over station.

Station mark: Tack in peg under bronze tablet cemented in rock 18 by 18 by 12 inches, set level with surface.

Reference marks: Tack in peg 26.3 feet southwest from center, in true azimuth 70° 51′; tack in peg 53.4 feet east from center, in true azimuth 277° 21′.

[Latitude, 38° 58′ 11.48″. Longitude, 119° 08′ 00.73″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Mount Wilson	29 34 46.31	209 31 31.75	4.1798938	9.403
Red Monument	37 15 28	217 12 30	4.05236	7.01
Mason schoolhouse	63 50 35	243 48 28	3.73434	3.37
Packhorse	64 43 20.24	244 38 32.99	4.0853892	7.564
Mickey	101 17 15.20	281 13 05.70	3.9883270	6.049
Yerington courthouse	125 43 11	305 42 05	3.49389	1.94
Yerington water tank	130 21 19	310 20 11	3.46310	1.80
Carson Hill	137 53 31.81	317 49 37.83	4.1247560	8.281
Thompson Smelter	163 42 26	343 39 45	4.34410	13.72
Cleaver Peak	180 08 04.7	0 08 06.3	4.4415672	17.176

MASON SCHOOLHOUSE, LYON COUNTY, NEV. (Not occupied.)

Public schoolhouse, east of railroad and south of Bridge Street, in town of Mason.

Station mark: Flagstaff on cupola.

[Latitude, 38° 56′ 53.88″. Longitude, 119° 11′ 22.92″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Mickey	132 31 58	312 29 56	3.80288	3.95
Luhr	243 48 28	63 50 35	3.73434	3.37

MICKEY (SINGATSE PEAK), LYON COUNTY, NEV.

On northern of two tips on highest mountain about 4.5 miles west of town of Yerington, 0.8 mile north of wagon road at Mickey Pass, and about 0.5 mile west of Nevada-Yerington mine.

Signal: Tripod about 8 feet high, black and white cloth, centered over tablet.

Station mark: Bronze tablet cemented in shattered rock of summit, stamped "6364 V. A."

Reference marks: Tack in peg 24.8 feet from and 10 feet below station, true azimuth 304° 19′; tack in peg 25.5 feet from and 10 feet below station, true azimuth 347° 59′.

[Latitude, 38° 59′ 13.08″. Longitude, 119° 14′ 37.38″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Packhorse	11 33 03.49	191 32 25.59	3.8604516	4.506
Buckskin	93 48 47	273 44 43	3.97087	5.81
Como	101 02 32.9	280 53 52.9	4.3064505	12.583
Wishart	126 38 19.96	306 36 42.66	3.6661333	2.881
Carson Hill	184 17 59.69	4 18 15.41	3.9033867	4.974
Thompson smelter	189 47 02	9 48 30	4.29185	12.17
Cleaver	200 24 32.82	20 28 44.6	4.4388988	17.071
Luhr	281 13 05.7	101 17 15.2	3.9883270	6.049
Yerington water tank	270 07 11	90 10 23	3.86527	4.56
Yerington courthouse	270 37 30	90 40 33	3.84607	4.36
Mason schoolhouse	312 29 56	132 31 58	3.80288	3.95
Red Monument	345 54 57	165 56 08	4.04993	6.97
Mount Wilson	352 04 52.9	172 05 47.4	4.1820635	9.450

PACKHORSE, LYON COUNTY, NEV.

On highest point north of Hudson Pass, in range between Smith Valley and Mason Valley (Singatse Range). Rocky knoll on ridge about 4.5 miles southeast of Ludwig, about 5 miles southwest of Mason, 4 miles northwest of Hudson Pass, about 2 miles south of Bluestone Pass, and 2 miles east of south of Douglass Hill mines, from which it is visible.

Signal: Tripod about 8 feet high, black and white cloth, centered over tablet.

Station mark: Bronze tablet in bowlder 36 by 24 by 14 inches on surface.

Reference marks: Neck of beer bottle set on end, level with surface, 22.82 feet north from center in true azimuth 198° 58′; neck of beer bottle set on end, level with surface, 24.05 feet southeast from center, in true azimuth 307° 52′.

[Latitude, 38° 55′ 22.67″. Longitude, 119° 15′ 37.66″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Desert Creek	7 53 28	187 51 25	4.5387706	21.484
Como	120 47 29.10	300 39 27.36	4.3314232	13.328
Buckskin gallows frame	134 26 04	314 22 38	4.04277	6.86
Wishart	167 03 05.34	347 02 06.01	4.0055546	6.294
Mickey	191 32 25.59	11 33 03.49	3.8604516	4.506
Yerington courthouse	230 17 41	50 21 22	4.04157	6.84
Yerington water tank	231 05 07	51 08 56	4.05265	7.01
Luhr	244 38 32.9	64 43 20.24	4.0853892	7.564
Red Monument	312 04 12	132 06 01	3.75087	3.50
Mount Wilson	335 57 50.12	155 59 22.54	3.9401418	5.414

RED MONUMENT, LYON COUNTY, NEV. (Not occupied.)

High hogback of dark-reddish volcanic rock about 5 miles southwest of Mason and 2 miles southwest of Nordyke, and 1.5 miles southeast of Copperbird claim. There are three large cairns on summit; the western one is pyramidal, and the other two slender conical.

Station mark: Middle cairn of the three as seen from north or south.

[Latitude, 38° 53′ 20.20″. Longitude, 119° 12′ 44.11″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Mount Wilson	8 39 11	188 38 55	3.62627	2.63
Packhorse	132 06 01	312 04 12	3.75087	3.50
Mickey	165 56 08	345 54 57	4.04993	6.97
Luhr	217 12 30	37 15 28	4.05236	7.01

THOMPSON SMELTER, LYON COUNTY, NEV. (Not occupied.)

Smelter at Thompson, about 3 miles northwest of Wabuska.

Station mark: Middle of high brick chimney.

[Latitude, 39° 09′ 38.84″. Longitude, 119° 12′ 18.78″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Mickey	9 48 30	189 47 02	4.29185	12.17
Carson Hill	13 34 34	193 33 21	4.06590	7.23
Como	56 25 16	236 15 08	4.44497	17.31
Luhr	343 39 45	163 42 26	4.34410	13.72

MOUNT WILSON, LYON COUNTY, NEV.

Highest point of top of hogback, the highest mountain of range between Smith Valley and Mason Valley (Singatse Range). About 2 miles south of Hudson Pass, about 8 miles southwest of Mason post office, 10 miles southwest of Yerington, and 4 miles southwest of Nordyke.

Signal: Cairn 5 feet high and 6-foot base, built by H. E. C. Fensier in 1889.

Station mark: Center of cairn.

Reference marks: Bronze tablet in solid rock 16 feet south of center, true azimuth 5° 07′; cairn, 5-foot base and 7 feet high, on ledge of rock 219.5 feet southeast of center, true azimuth 285° 58′.

[Latitude, 38° 51′ 04.6″.[a] Longitude, 119° 13′ 10.5″.[a]]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Desert Creek Peak	17 32 15.3	197 28 40.5	4.4404205	17.130
Desert Creek Peak[a]	17 32 28	197 28 53	4.4405014	17.134
Como[a]	130 46 47	310 37 13	4.4625328	18.025
Buckskin frame	143 56 45	323 51 55	4.28786	12.06
Packhorse	155 59 22.54	335 57 50.12	3.9401418	5.414
Mickey	172 05 47.4	352 04 52.9	4.1820635	9.450
Red Monument	188 38 55	8 39 11	3.62627	2.63
Cleaver	190 24 30.2	10 27 47.0	4.617583	25.782
Luhr	209 31 31.75	29 34 46.41	4.179938	9.403

[a] Figures from Bulletin 122.

WISHART, LYON COUNTY, NEV.

On knoll on yellowish ridge about 1 mile west of Mason Pass and 4 miles north of Ludwig. The station is about 1 mile southwest from Martha Washington shaft and 1.5 miles north of Albany claims. The highest point of ridge is about 1,500 feet north of station and about 50 feet above it.

Signal: Tripod 4.5 feet high, black and white cloth, over center of station.

Station mark: Neck of beer bottle on end, 10 inches under surface, over which is bronze tablet cemented in flat stone 18 by 14 by 9 inches, sunk level with surface.

Reference mark: Middle of gallows frame Martha Washington shaft about 1 mile northeast, in true azimuth 234° 44′.

[Latitude, 39° 00′ 42.77″. Longitude, 119° 17′ 11.994″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Buckskin, gallows frame	69 03 16	249 00 49	3.77862	3.73
Carson Hill	219 36 14.46	39 38 07.56	3.8307836	4.209
Mickey	306 36 42.66	126 38 19.96	3.6661333	2.881
Packhorse	347 02 06.01	167 03 05.34	4.0055546	6.294

YERINGTON COURTHOUSE, LYON COUNTY, NEV. (Not occupied.)

Lyon County courthouse at Yerington.

Station mark: Flagstaff, east front.

[Latitude, 38° 59′ 10.50″. Longitude, 119° 09′ 45.92″.]

To station—.	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Packhorse	50 21 22	230 17 41	4.04157	6.84
Mickey	90 40 33	270 37 30	3.84607	4.36
Carson Hill	141 31 57	321 29 09	4.01287	6.40
Luhr	305 42 05	125 43 11	3.49389	1.94

POLITECHNIKA GDAŃSKA ZAKŁAD GEOLOGII

YERINGTON WATER TANK, LYON COUNTY, NEV. (Not occupied.)

High-pressure water tank of city supply.
Station mark: Center of ball on top of tank.

[Latitude, 38° 59′ 12.48″. Longitude, 119° 09′ 32.71″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Packhorse	51 08 56	231 05 07	4.05265	7.01
Mickey	90 10 23	270 07 11	3.86527	4.56
Carson Hill	139 57 51	319 54 55	4.01931	6.50
Luhr	310 20 11	130 21 19	3.46310	1.80

Manhattan and vicinity quadrangle.

NYE COUNTY.

The field work was done by A. T. Fowler in September and October, 1914. Eight stations were occupied, two of which, Lone Mountain and Toiyabe Dome, were United States Coast and Geodetic Survey stations, and a third, Toiyabe Dome, Southeast Summit, was supposed to be a secondary point of the same survey, but its computed position did not check with position given by the Coast Survey. Positions are on North American datum.

Five points were occupied and marked.

BALD MOUNTAIN, NYE COUNTY, NEV.

Bald Mountain is a prominent bare mountain about 3 miles north of Manhattan. Top of hill is of a light-gray color, and signal is difficult to distinguish unless light is favorable.

Can be reached by driving out the east Manhattan road and taking side road to the north up the Slaughter House Gulch. Wagon can be taken about 1½ miles up this gulch to the old slaughterhouse. From this point saddle horses can be taken over an easy trail up the gulch to the summit.

Station mark: A bronze triangulation tablet.

Signal: Rock monument 5 feet, with flagpole and flag.

[Latitude, 38° 34′ 39.06″. Longitude, 117° 02′ 41.39″.]

To station—	Azimuth.	Back azimuth.	Distance.
	° ′ ″	° ′ ″	*Log. meters.*
Toiyabe Dome	136 45 56.79	316 34 24.42	4.5909388
Lone Mountain	32 45 24.24	212 28 42.48	4.8624770
Toquima	215 24 06.56	35 27 15.27	4.1009223
Toiyabe Dome, Southeast Summit	143 58 42.94	323 50 59.28	4.4834777
Summit	5 59 50.27	185 59 30.58	3.8658228
Low Flag	68 33 18.06	248 30 25.48	3.8574465
Salisbury	354 48 55.78	174 49 05.35	3.6141675
Friday Flag	101 36 51.15	281 34 47.47	3.6900712

FRIDAY FLAG, NYE COUNTY, NEV.

Station is on a steep red hill 2 miles west of Bald Mountain and at the edge of the Big Smoky Valley. It is about 4 miles northwest of Manhattan, and rig can be taken to within three-quarters of a mile of the station, along old wood road, leaving town past the War Eagle mill.

Station mark: A bronze triangulation tablet set in ledge.

Signal: Stone windbreak built around west and south sides of station.

[Latitude, 38° 35′ 11.00″. Longitude, 117° 05′ 59.64″.]

To station—	Azimuth.			Back azimuth.			Distance.
	°	′	″	°	′	″	*Log. meters.*
Bald Mountain	281	34	47.47	101	36	51.15	3.6900712
Low Flag	27	43	33.06	207	42	44.06	3.6117226
Summit	334	01	42.09	154	03	25.94	3.9645655
Salisbury	314	28	35.60	134	30	48.78	3.8603269

LOW FLAG, NYE COUNTY, NEV.

On a low hill about 3 miles west of Manhattan. It is one-quarter of a mile west of the Manhattan–Round Manhattan road and three-quarters of a mile north of Central, a camp now nearly deserted. The Manhattan–Round Manhattan road leaves the Manhattan Gulch at Central and turns north.

Wagon can be taken nearly to station.

Signal: Quadripod signal covered with white cloth with flagpole and flag.

Station mark: A bronze triangulation table set in ledge.

[Latitude, 38° 33′ 13.58″. Longitude, 117° 07′ 18.23″.]

To station—	Azimuth.			Back azimuth.			Distance.
	°	′	″	°	′	″	*Log. meters.*
Toiyabe Dome, Southeast Summit	157	36	48.08	337	31	57.46	4.4093217
Bald Mountain	248	30	25.48	68	33	18.06	3.8574465
Summit	308	08	15.40	128	10	48.13	3.8780772
Salisbury	281	38	12.48	101	41	14.56	3.8588191
Friday Flag	207	42	44.06	27	43	33.06	3.6117226

SALISBURY, NYE COUNTY, NEV.

Salisbury Peak is the highest summit in a wooded ridge running northeast from Manhattan and is about 2 miles from the town. It is easily reached by following wagon road leading to Hoosier mine to summit of low pass in hills just east of the White Gap mine, leaving road in this pass and going north about one-half mile to the summit.

Station is on site of old location monument on north brow of hill.

Signal: Stone monument, wrapped with white cloth with flagpole and flag.

Station mark: A bronze tablet set in block of cement at bottom of pit 2 feet deep, solid rock not being found.

[Latitude, 38° 32′ 26.22″. Longitude, 117° 02′ 26.05″.]

To station—	Azimuth.			Back azimuth.			Distance.
	°	′	″	°	′	″	*Log meters.*
Summit	19	33	34.65	199	33	05.29	3.5317292
Low Flag	101	41	14.56	281	38	12.48	3.8588191
Friday Flag	134	30	48.78	314	28	35.60	3.8603269
Bald Mountain	174	49	05.35	354	48	55.78	3.6141675

SUMMIT, NYE COUNTY, NEV.

On a low hill directly south of the "Summit," so called, where the main road from Manhattan to Tonopah crosses the summit of a low gap in the Toquima Range, about 2 miles south of Manhattan.

Station is about 1,500 feet south of road and wagon can be taken nearly to top of hill. Station is about 20 feet west of true summit of hill, which is covered with juniper trees and about 3 feet lower in elevation.

Signal: Large quadripod signal covered with white cloth with flagpole and flag.

Station mark: A bronze triangulation tablet set in block of cement at bottom of pit 2 feet in depth. No solid rock was found.

[Latitude, 38° 30′ 42.252″. Longitude, 117° 03′ 13.055″.]

To station—	Azimuth.			Back azimuth.			Distance.
	°	′	″	°	′	″	*Log meters.*
Toiyabe Dome, Southeast Summit	151	46	08.10	331	38	44.47	4.5590905
Toquima	204	39	37.31	24	43	05.63	4.2867040
Bald Mounrain	185	59	30.58	5	59	50.27	3.8658228
Low Flag	128	10	48.13	308	08	15.40	3.8780772
Salisbury	199	33	05.29	19	33	34.65	3.5317292
Friday Flag	154	03	25.94	334	01	42.09	3.9645655

TOIYABE DOME, SOUTHEAST SUMMIT, NYE COUNTY, NEV.

On a high rounded summit, near end of ridge running east from Toiyabe Dome, locally known as Arc Dome.

Southeast Dome overlooks the Big Smoky Valley to the north and south and is on a ridge directly above Darroughs Hot Springs. There is a rocky peak a quarter of a mile east of station and nearer the end of the ridge, which is more noticeable in looking at the ridge from the Big Smoky Valley.

Station is most easily reached by trail up South Twin River, at the head of which there are good camp sites. Saddle horses can be taken to the summit.

Signal is a stone wall 6 feet high built around north and west sides of station to serve as windbreak at time station was occupied.

Station mark: A triangulation tablet set in rock.

[Latitude, 38° 47′ 56.90″. Longitude, 117° 15′ 03.28″.]

To station—	Azimuth.			Back azimuth.			Distance.
	°	′	″	°	′	″	*Log meters.*
Lone Mountain	13	56	12.42	193	47	09.17	4.9471774
Toiyabe Dome	113	07	46.54	293	03	57.55	3.9814813
Toquima	299	29	56.30	119	40	49.67	4.4624478
Bald Mountain	323	50	59.28	143	58	42.94	4.4834777
Summit	331	38	44.47	151	46	08.10	4.5590905
Low Flag	337	31	57.46	157	36	48.08	4.4693217

Ivanpah and Las Vegas quadrangles and Yellow Pine mining district.

CLARK COUNTY.

The positions in the following list were determined by L. F. Biggs, in September and October, 1915, on approximate North American datum.

This triangulation is dependent on a weak base (Clark, Olcott, and Kingston) and it should be connected with stations whose coordinates are well determined before the positions can be finally adjusted.

For positions in California in this locality see Bulletin 644–C.

ARDEN, CLARK COUNTY, NEV. (Not occupied.)

Center of black water tank at Arden, a station on the San Pedro, Los Angeles & Salt Lake Railroad 12 miles south of Las Vegas.

[Latitude, 36° 00′ 49.93″. Longitude, 115° 13′ 56.74″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Bird	43 55 14.03	223 49 49.54	4.3007460	12.419
Olcott	77 37 34.37	257 28 06.09	4.3945892	15.415
Mountain Springs	96 20 28.91	276 11 40.60	4.3546137	14.059

BIRD, CLARK COUNTY, NEV.

On highest point of ridge 5 miles north-northeast of Good Springs and 1½ miles west of Birds Spring.

Signal: A rock cairn 6 feet high.

Station mark: A United States Geological Survey bronze triangulation tablet under center of cairn.

[Latitude, 35° 53′ 02.46″. Longitude, 115° 23′ 09.48″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Diablo Grande	16 26 17.76	196 23 55.81	4.3337066	13.399
Shenandoah	71 24 29.78	251 20 09.94	4.0697081	7.296
Olcott	131 07 27.03	311 03 23.94	4.1393085	8.564
Mountain Springs	152 52 10.69	332 48 47.78	4.2780511	11.787
Arden	223 49 49.54	43 55 14.03	4.3007460	12.419
Borax	347 53 45.75	167 55 19.68	4.2844156	11.961

BORAX, CLARK COUNTY, NEV. (Not occupied.)

Center of black water tank at Borax, a station on the San Pedro, Los Angeles & Salt Lake Railroad 24 miles south of Las Vegas.

[Latitude, 35° 42′ 51.76″. Longitude, 115° 20′ 28.91″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Diablo Grande	79 37 45.66	259 33 50.30	4.0131508	6.405
Shenandoah	134 51 42.96	314 45 49.76	4.3301080	13.288
Bird	167 55 19.68	347 53 45.75	4.2844156	11.961

DIABLO GRANDE (IVANPAH), CLARK COUNTY, NEV.

On the highest point of hill known as Diablo Grande, about 10 miles south of Goodsprings.

Station mark: A chiseled cross under center of cairn.

Signal: A rock cairn.

Reference mark: Aluminum tablet marked "V. A. 1910 5865," 6.2 feet from station. True azimuth, station to reference mark, 66° 40′.

[Latitude, 35° 41′ 51.37″. Longitude, 115° 27′ 12.19″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Clark	32 40 54.31	212 36 11.41	4.3554467	14.086
Knights Well	87 47 16.50	267 44 32.44	3.8496820	4.396
Kingston	94 34 12.06	274 18 01.28	4.6225326	26.055
Corner secs. 1, 2, 35, and 36	109 05 33.96	289 02 35.21	3.9109050	5.061
Ripley	129 50 06.55	309 44 55.07	4.2413989	10.833
Green Monster	145 00 45.43	324 54 36.05	4.4411812	17.161
Shenandoah	163 25 55.52	343 23 58.15	4.2471933	10.979
Olcott	171 46 22.82	351 44 42.35	4.4778740	18.673
Bird	196 23 55.81	16 26 17.76	4.3337066	13.399
Borax	259 33 50.30	79 37 45.66	4.0131508	6.405

GREEN MONSTER, CLARK COUNTY, NEV.

On high hill about 1 mile northeast of Green Monster mine and 7 miles north of Ripley.

Signal: A rock cairn 5 feet high.

Station mark: Chiseled cross under center of cairn.

Reference mark: A United States Geological Survey triangulation tablet 18.3 feet from cairn. True azimuth, station to reference mark, 120° 58′.

[Latitude, 35° 54′ 05.04″. Longitude, 115° 37′ 43.67″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Kingston	53 17 29.58	233 07 25.91	4.5097518	20.096
Mesa	198 43 51.98	18 45 54.58	4.2114361	10.111
Olcott	238 13 31.72	58 18 01.58	4.1320639	8.422
Shenandoah	297 41 30.73	117 45 43.13	4.0865641	7.584
Diablo Grande	324 54 36.05	145 00 45.43	4.4411812	17.161
Corner secs. 1, 2, 35, and 36	337 43 00.38	157 46 10.68	4.3335927	13.395
Knights Well	338 56 55.93	159 00 20.84	4.3895211	15.236
Ripley	347 50 12.84	167 51 10.42	4.0688141	7.281
Clark	354 58 17.75	174 59 42.76	4.6218156	26.012

MESA, CLARK COUNTY, NEV.

On highest point of hill about 3 miles west of Mountain Springs.

Signal: A rock cairn 7 feet high.

Station mark: A chiseled circle under center of cairn.

Reference mark: A United States Geological Survey bronze tablet, 6.8 feet from cairn. True azimuth, station to reference mark, 160° 30′.

[Latitude, 36° 02′ 24.98″. Longitude, 115° 34′ 14.93″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Green Monster	18 45 54.58	198 43 51.98	4.2114361	10.111
Kingston	41 54 59.92	221 42 52.89	4.6689748	28.995
Mountain Springs	273 15 15.53	93 18 23.74	3.9042702	4.984
Olcott	322 45 21.36	142 47 48.98	4.0169012	6.460

MOUNTAIN SPRINGS, CLARK COUNTY, NEV.

On peak 1½ miles east of Mountain Springs.

Signal: A rock cairn 6 feet high with tree in center.

Station mark: Chisel mark (X) under center of cairn.

Reference mark: United States Geological Survey bronze triangulation tablet 7 feet from cairn. True azimuth, station to reference mark, 203° 00′.

[Latitude, 36° 02′ 10.08″. Longitude, 115° 28′ 55.02″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Olcott	12 25 51.87	192 25 11.44	3.9034861	4.975
Mesa	93 18 23.74	273 15 15.53	3.9042702	4.984
Arden	276 11 40.60	96 20 28 91	4.3546137	14.059
Rose Tank	307 23 06	127 24 44	3.72052	3.265
Bird	332 48 47.78	152 52 10.69	4.2780511	11.787

OLCOTT, CLARK COUNTY, NEV.

Described in Bulletin 496, page 38, as follows:

"Highest point on Mount Olcott. It is about 36 miles southwest of Las Vegas, 40 miles southeast of Manse post office, and 3 miles east of the Potosi mine. The station can be reached from Mountain Spring by going 2.25 miles southeast to forks of road,

thence southwest to Hussey mine via Potosi mine, and eastward on south slope of mountain to peak.

"Station mark: Tablet cemented in rock."

[Latitude, 35° 57′ 56.37″. Longitude, 115° 30′ 03.81″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Shenandoah	3 16 08.51	183 15 51.41	4.1082033	7.972
Clark	9 12 36.11	189 09 32.54	4.6942983	30.736
Kingston	54 49 23.12	234 34 49.68	4.6614279	28.496
Green Monster	58 18 01.58	238 13 31.72	4.1320639	8.422
Mesa	142 47 48.98	322 45 21.36	4.0169012	6.460
Mountain Spring	192 25 11.44	12 25 51.87	3.9034861	4.975
Rose Tank	231 51 48	51 54 07	3.87497	4.659
Arden	257 28 06.09	77 37 34.37	4.3945892	15.415
Bird	311 03 23.94	131 07 27.03	4.1393085	8.564
Diablo Grande	351 44 42.35	171 46 22.82	4.4778740	18.673

RIPLEY, CLARK COUNTY, NEV.

Center of windmill at post office, Ripley, Nev.

[Latitude, 35° 47′ 53.40″. Longitude, 115° 36′ 05.35″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Green Monster	167 51 10.42	347 50 12.84	4.0688141	7.281
Diablo Grande	309 44 55.07	129 50 06.55	4.2413989	10.833
Clark	357 44 35.38	177 45 02.95	4.4810177	18.809

ROSE TANK, CLARK COUNTY, NEV.

Center of wooden water tank on the Potosi-Arden road about 6 miles east of Potosi mine and near forks of road to Goodsprings.

[Latitude, 36° 00′ 26.54″. Longitude, 115° 26′ 08.31″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Olcott	127 24 44	307 23 06	3.72052	3.265
Mountain Springs	51 54 07	231 51 48	3.87497	4.659

SHENANDOAH, CLARK COUNTY, NEV.

On the highest hill about 5 miles west-northwest of Goodsprings and about 1 mile west of Yellow Pine mine.

Signal: A rock cairn 7 feet high.

Station mark: A bottle neck cemented in rock under center of cairn.

[Latitude, 35° 51′ 00.79″. Longitude, 115° 30′ 32.96″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Knights Well	6 41 54.22	186 41 07.23	4.2387279	10.767
Corner secs. 1, 2, 35, and 36	10 31 21.18	190 30 19.51	4.1618474	9.020
Clark	11 16 37.81	191 13 51.51	4.5650049	22.822
Kingston	69 40 23.08	249 26 07.91	4.5932003	24.353
Green Monster	117 45 43.13	297 41 30.73	4.0865641	7.584
Olcott	183 15 51.41	3 16 08.51	4.1082033	7.972
Bird	251 20 09.94	71 24 29.78	4.0697081	7.296
Borax	314 45 49.76	134 51 42.96	4.3301080	13.288
Diablo Grande	343 23 58.15	163 25 55.52	4.2471933	10.979

Bristol Range, Delamar, Newland, and Panaca quadrangles.

LINCOLN COUNTY.

In the summer of 1915 H. H. Hodgeson extended triangulation from U. S. Coast and Geodetic Survey primary station Pioche and supplementary station White Rock over the above-named quadrangles.

Ten primary stations and seven 3-point stations were occupied and 25 points were located by intersections, all on North American datum.

BAILEY, LINCOLN COUNTY, NEV.

A three-point station on a red brushy summit about 4 miles northwest of Bristol well, on east side of Bristol-Ely road and 2 miles northwest of the Horn Silver mine. Can be reached easily with animals from Bristol Well.

Station mark: Bronze triangulation tablet cemented in rock.

Signal: Cedar tree, brushy top, cairn around base and centered over station mark.

Reference marks: (A) Chiseled cross in rock distant from station mark 18.1 feet and in true azimuth 66° 36′; (B) chiseled cross in rock distant from station mark 14.8 feet and in true azimuth 229° 53′.

[Latitude 38° 10′ 04.24″. Longitude 114° 42′ 38.75″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
West Lava	35 38 33	215 30 39	4.45144	17.570
Lava Tit	61 15 49	241 11 34	4.05903	7.124
Black Cliff	71 36 12	251 21 45	4.55728	22.420
Sharks Tooth	90 19 21	270 11 49	4.25125	11.082
Black Cone	107 49 25	287 42 30	4.21297	10.146
Wilson	253 21 42.98	73 33 26.35	4.4603818	17.936
Parsnip	273 54 17.00	94 08 34.86	4.5300638	21.058
Jackrabbit	313 37 41.40	133 41 30.43	4.0965135	7.760
Bristol	329 48 26.40	149 52 23.19	4.2698328	11.566
Highland	338 59 53.22	159 04 47.31	4.5124557	20.221
Charcoal	346 23 57.72	166 24 41.84	3.8693523	4.599
White Cliff	351 59 59	172 00 43	4.09935	7.811

BENNETT, LINCOLN COUNTY, NEV. (Not occupied.)

The rocky south point of a double summit on the north side of Bennett Pass in the Highland Range. It is 6 miles south from Highland Peak.

Signal and station mark: Apparent highest point.

[Latitude 37° 50′ 09.5″. Longitude 114° 33′ 32.4″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Ely	212 01 34	32 04 24	4.10744	7.958
Spring Valley	229 44 03	49 55 27	4.55089	22.092
Red Hill	236 38 26	56 43 18	4.14281	8.633
Pioche	249 20 36	69 39 19	4.67818	29.616

BLACK CONE, LINCOLN COUNTY, NEV. (Not occupied.)

A high dark cone summit about 15 miles northwest from Bristol Well; on same ridge with and about 3 miles northeast of Sharks Tooth. A white rock outcrop (on the east slope) dipping south about 300 feet below the summit gives prominence to the dark upper part of the cone.

Signal and station mark: Apparent highest point.

[Latitude 38° 12′ 45.8″. Longitude 114° 53′ 18.0″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Wilson	265 33 50	85 52 09	4.63681	26.925
Bailey	287 42 30	107 49 25	4.21297	10.146
Bristol	310 08 00	130 18 32	4.51374	20.282
Highland	322 19 10	142 30 39	4.64967	27.735

BLACK CLIFF, NYE COUNTY, NEV. (Not occupied.)

A high rocky cliff point on a dark summit, sometimes called Indian Peak, at the north end of the Seaman Range, which breaks off abruptly at this cliff, while to the south it extends for 20 miles with higher summits than the one sighted.

Signal and station mark: Apparent highest point.

[Latitude 38° 03′ 52.6″. Longitude 115° 06′ 03.2″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Bailey	251 21 45	71 36 12	4.55728	22.420
Wilson	252 08 39	72 34 48	4.81251	40.352
Jackrabbit	266 05 49	86 24 04	4.63714	26.946
Highland	292 14 22	112 33 41	4.69614	30.867

BRISTOL, LINCOLN COUNTY, NEV.

On a high rocky summit of the Bristol Range, 12 miles northwest from the town of Pioche and 3 miles north along the ridge from Stampede Gap.

Station mark: Bronze triangulation tablet cemented in rock.

Signal: Pine tree, brushy top, cairn around base and centered over station mark.

Reference marks: (A) Chiseled cross in rock distant from station mark 17.2 feet and in true azimuth 171° 16′; (B) chiseled cross in rock distant from station mark 19.4 feet and in true azimuth 333° 21′.

[Latitude 38° 01′ 22.25″. Longitude 114° 36′ 14.96″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
West Lava	75 07 09	254 56 19	4.42712	16.614
White Cliff	115 37 37	295 34 25	3.92620	5.253
Lava Tit	118 39 58	298 31 46	4.34445	13.734
Sharks Tooth	120 49 51	300 38 22	4.50036	19.666
Black Cone	130 18 32	310 08 00	4.51374	20.281
Charcoal	139 28 33.47	319 25 20.90	4.0686365	7.277
Bailey	149 52 23.19	329 48 26.40	4.2698328	11.566
Wilson	216 58 57.18	37 06 42.46	4.4837365	18.927
Page	221 43 06.21	41 50 13.58	4.4035069	15.734
Parsnip	240 39 31.76	60 49 51.51	4.4481793	17.439
White Rock No. 1	246 41 38	66 52 50	4.46075	17.951
South Parsnip	254 10 02	74 20 36	4.45521	17.724
Low Cone	257 21 32	77 29 52	4.30670	12.591
Danton	259 31 07	79 43 59	4.49220	19.300
Eight Mile	264 28 48.51	84 33 38.57	4.0620584	7.168
Quarter Corner	262 39 21.67	82 48 34.48	4.3435441	13.706
Spring Valley	265 51 29.70	86 04 35.30	4.4937948	19.371
Section Corner	269 05 20.73	89 16 35.43	4.4267963	16.602
Pioche	274 35 51.64	94 56 17.02	4.6877241	30.274
Red Butte	275 02 28.89	95 13 13.23	4.4086835	15.923
Trestle	292 49 17.22	112 56 21.81	4.2617251	11.352
Tank	300 40 29.6	120 53 36.2	4.227982	10.504
Smelter	300 44 17.77	120 50 11.74	4.2131998	10.152
Pioche School	306 00 29.97	126 05 11.62	4.2242785	10.414
Ely	312 33 31.29	132 38 02.47	4.1646145	9.098
Stampede	338 46 06.98	158 47 00.25	3.7658856	3.624
Gap	349 53 12.61	169 53 39.59	3.7847822	3.785
Highland	350 54 53.19	170 55 50.75	4.1606689	8.590

BULLIONVILLE, LINCOLN COUNTY, NEV. (Not occupied.)

Brick chimney at Bullionville smelter, about 1.5 miles northwest of Panaca.
Signal and station mark: Center of chimney.

[Latitude 37° 48′ 25.47″. Longitude 114° 24′ 00.26″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters*	*Miles.*
Highland	121 40 57.95	301 34 24.54	4.2650302	11.439
Ely	152 57 07.01	332 54 06.49	4.1984328	9.813
Red Hill	167 38 48.83	347 37 49.21	4.0451501	6.895

CHARCOAL, LINCOLN COUNTY, NEV. (Not occupied.)

The middle one of three charcoal ovens, about 1,000 feet southwest from Bristol Well.
Signal and station mark: Center of oven.

[Latitude 38° 06′ 10.89″. Longitude 114° 41′ 27.31″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Bailey	166 24 41.84	346 23 57.72	3.8693523	4.599
Jackrabbit	281 02 20.65	101 05 25.43	3.8713584	4.621
Bristol	319 25 20.90	139 28 33.47	4.0686365	7.277

DANTON, LINCOLN COUNTY, NEV. (Not occupied.)

A cone summit on the north side of the Spring Valley-Pioche road and in the pass where the road crosses the Wilson Creek Range. It is about 3 miles west of Danton Spring.
Signal and station mark: Apparent highest point.

[Latitude 38° 04′ 23.7″. Longitude 114° 15′ 22.2″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Ely	52 04 39	231 56 20	4.40055	15.628
Highland	54 59 48	234 47 54	4.53890	21.491
Bristol	79 43 59	259 31 07	4.49220	19.300
Jackrabbit	98 35 37	273 22 36	4.49007	19.205

EIGHTMILE, LINCOLN COUNTY, NEV. (Not occupied.)

A large wooden windmill at the Eightmile Well, located in Patterson, Wash. It is about 8 miles northwest of the town of Pioche and is on the Pioche-Silves Park road.
Signal and station mark: Center of windmill tower.

[Latitude 38° 01′ 57.98″. Longitude 114° 28′ 24.12″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Ely	3 50 20.4	183 50 01.8	4.041943	6.844
Bristol	84 33 38.6	264 28 48.5	4.062058	7.168
Wilson	196 29 45.8	16 32 40.3	4.383987	15.043
Parsnip	225 50 27.5	45 56 04.5	4.258202	11.260

ELY (PIOCHE PEAK, U. S. COAST AND GEODETIC SURVEY), LINCOLN COUNTY, NEV.

On the summit of Mount Ely, about 2 miles northwest from town of Pioche. Station is easily reached with animals.

Station mark: Bronze triangulation tablet cemented in rock.

Signal: Cedar tree, brushy top, cairn around base and centered over station mark.

Reference marks: (A) Chiseled cross in rock distant from station mark 31 feet and in true azimuth 352° 31′; (B) chiseled cross in rock distant from station mark 29.6 feet and in true azimuth 271° 46′.

NOTE.—This station is a supplementary point of the U. S. Coast and Geodetic Survey, located in 1881 and called "Pioche Peak." The old monument is very small. The bronze triangulation tablet (present station mark) is at the center of old monument, and the Coast Survey position for the same is: Latitude 37° 56′ 01.546″; longitude, 114° 28′ 54.342″.

[Latitude 37° 56′ 01.55″. Longitude 114° 28′ 54.32″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
South Highland	15 48 32	195 45 47	4.38344	19.024
Bennett	32 04 24	212 01 34	4.10744	7.958
Highland	62 33 36.94	242 30 03.67	3.9802544	5.938
Stampede	117 16 11.34	297 12 33.56	3.9878050	6.042
Bristol	132 38 02.47	312 33 31.29	4.1646145	9.078
Jackrabbit	147 31 50.95	327 27 21.67	4.3135223	12.790
Eightmile	183 50 01.78	3 50 20.36	4.0419426	6.844
Page	192 01 26.32	12 04 01.58	4.4684326	12.280
Wilson	192 32 29.43	12 35 42.43	4.5445520	21.772
Parsnip	210 11 06.31	30 16 53.92	4.4364710	16.775
White Rock	216 34 52	36 41 32	4.42345	16.474
Quarter Corner	221 16 06.60	41 20 47.60	4.2273010	10.487
South Parsnip	223 24 17	43 32 19	4.38238	14.987
Danton	231 56 20	52 04 39	4.40055	15.628
Spring Valley	239 15 03.95	59 23 37.53	4.3743199	14.712
Red Butte	242 45 12.34	62 51 24.92	4.2206456	10.328
Smelter	245 04 58.55	65 06 21.24	3.5588492	2.250
Pioche Tank	251 47 23.54	71 48 58.77	3.6000411	2.474
Pioche	261 05 38.70	81 21 31.80	4.5829009	23.782
Pioche School	269 31 02.93	89 32 13.35	3.4467459	1.739
Rim	292 53 50	113 06 57	4.53179	21.141
South Rim	296 32 42	116 45 13	4.52483	20.805
Red Hill	303 48 45.94	123 50 46.94	3.7626372	3.597
Bullionville	332 54 06.49	152 57 07.01	4.1984328	9.813

FAIRVIEW PEAK, LINCOLN COUNTY, NEV. (Not occupied.)

The larger of two cone-shaped hills about 6 miles northeast from Bristol Well and 7 miles northwest from Bristol Pass.

NOTE.—South Cone is known locally as Fairview Peak.

Signal and station mark: Approximate highest point.

[Latitude 38° 12′ 08.7″. Longitude 114° 41′ 06.0″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Parsnip	281 02 11	101 15 32	4.50714	19.975
Red Butte	304 10 42	124 24 57	4.59596	24.508
Smelter	323 11 37	143 21 03	4.54784	21.937
Jackrabbit	331 26 14	151 29 06	4.15174	8.812

FOGLIANI, LINCOLN COUNTY, NEV.

A three-point station on a small summit at point of ridge, 535 feet east of the chimney of Spring Valley ranch house of Louis Fogliani.

Station mark: Bronze triangulation tablet cemented in rock.

Signal: Small pole and flag.

Reference marks: Center of large brick chimney on main part of the Fogliani ranch house distant from station mark 535 feet and in true azimuth 100° 17′ 42″.

[Latitude 38° 04′ 39.10″. Longitude 114° 09′ 51.01″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Spring Valley	62 46 52.68	242 43 42.29	3.9278139	5.262
Parsnip	118 30 13.58	298 24 16.10	4.2054444	9.972
Wilson	132 07 54.19	311 59 21.12	4.4350641	16.921
Pioche	315 34 28.40	135 38 38.65	4.1510832	8.799
Fogliani's house chimney	100 17 42	.....	2.21224	[a] 535

[a] Feet.

GAP, LINCOLN COUNTY, NEV.

A three-point station about 300 feet west of the wagon road in Stampede Gap and 25 feet above the road, on a blue-limestone point. (This three-point station was made to locate a section corner.)

Station mark: None.

Signal: Pole and flag.

Reference marks: (A) Bronze triangulation tablet cemented in rock by Levelman D. S. Birkett in 1915 and described as follows: "Stampede Pass, 225 feet west of and 6 feet below level of summit of, 20 feet north and 7 feet above wagon road, witnessed by pile of bowlders, in limestone outcrop; bronze tablet stamped '7315 1915 29' (should be restamped 30); 7,315.432 feet," distant from instrument station 480 feet and in true azimuth 211° 36′ 30″. (B) Corner to secs. 4, 5, 8, and 9, T. 1 N., R. 66 E. Mount Diablo meridian. Stone in place at corner (properly marked) and four bearing trees (properly marked) distant from instrument station 350 feet and in true azimuth 359° 03′ 00″.

[Latitude 37° 58′ 07.72″. Longitude 114° 35′ 31.13″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Lava Tit	129 03 48	308 54 42	4.42080	16.374
White Cliff	138 02 14	317 58 54	4.11311	8.062
Bristol	169 53 39.6	349 53 12.6	3.784782	3.785
Stampede	241 44 14.6	61 44 40.9	3.073252	7.357
Bench mark 7315	211 36 30	.....	.....	[a] 480
Section Corner	359 03 00	.....	.....	[a] 350

[a] Feet.

GRAY CONE, LINCOLN COUNTY, NEV. (Not occupied.)

A gray rocky cone summit about 4 miles southeast from the town of Pioche and on the east side of the Pioche-Panaca road.

Signal and station mark: Apparent highest point.

[Latitude 37° 54′ 17.3″. Longitude 114° 24′ 26.7″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Red Hill	89 43 46	269 43 03	3.23688	10.719
Red Butte	217 19 55	37 23 23	4.13354	8.451
Spring Valley	222 05 07	42 10 58	4.31398	12.803
Pioche	253 45 39	73 58 47	4.51298	20.245

HIGHLAND, LINCOLN COUNTY, NEV.

A summit of Highland Ridge about 8 miles west from the town of Pioche. Summit can easily be reached with animals from the ranch of James Wheeler, who lives about 3 miles northeast from the peak. The route lies by road to the forks of Water Canyon, thence up the right fork by trail to saddle in main divide, thence south along ridge to station.

Station mark: Bronze triangulation tablet cemented in rock.

Signal: Pine tree, brushy top, cairn around base and centered over station mark.

Reference marks: (A) Chiseled cross in rock distant from station mark 38.3 feet and in true azimuth 27° 12′; (B) chiseled cross in rock distant from station mark 23.2 feet and in true azimuth 139° 36′.

[Latitude 37° 53′ 38.59″. Longitude 114° 34′ 41.40″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
West Lava	104	48	39	284	36	51	4.46376	10.076
Black Cliff	112	33	41	292	14	22	4.69614	30.867
Sharks Tooth	136	01	18	315	48	52	4.62754	26.357
Lava Tit	138	58	08	318	48	58	4.51870	20.514
Black Cone	142	30	39	322	19	10	4.64967	27.734
White Cliff	151	08	48	331	04	39	4.31156	12.732
Bailey	159	04	47.31	338	59	53.22	4.5124557	20.221
Bristol	170	55	50.75	350	54	53.19	4.1606689	8.996
Stampede	178	53	35.39	358	53	31.08	3.9474219	5.505
Wilson	202	33	52.16	22	40	39.09	4.6214328	25.989
Page	203	42	22.83	23	48	31.85	4.5593252	22.525
Parsnip	218	21	09.20	38	30	30.44	4.5533680	22.219
Danton	234	47	54	54	59	48	4.53890	21.491
Section Corner	238	56	38.75	59	06	54.93	4.4551548	17.721
Ely	242	30	03.67	62	33	36.94	3.9802544	5.937
Red Butte	242	37	25.21	62	47	11.07	4.4179046	16.265
Smelter	243	11	39.18	63	16	35.15	4.1197226	8.186
Pioche	257	21	47.89	77	41	13.98	4.6760625	29.472
Red Hill	264	51	36.82	84	57	10.98	4.1252579	8.291
Little Summit	267	33	22	87	49	34	4.58790	24.058
Rim	282	26	57	102	43	37	4.61058	25.347
South Rim	285	18	17	105	34	21	4.60052	24.767
Bullionville	301	34	24.54	121	40	57.95	4.2650302	11.439

JACKRABBIT, LINCOLN COUNTY, NEV.

A checked three-point station on a dark rocky summit near the north end of the Bristol Range and south from Bristol Pass. It is about half a mile north from the Hillside mine and on the north side of an aerial tram which connects the Hillside and Jackrabbit mines. Can be easily reached by trail with animals from either mine.

Station mark: Bronze triangulation tablet cemented in rock.

Signal: Pine tree, brushy top, cairn around base and centered over station mark.

Reference marks: (A) Chiseled cross in rock distant from station mark 25.1 feet and in true azimuth 352° 40′; (B) chiseled cross in rock distant from station mark 22.8 feet and in true azimuth 246° 16′.

[Latitude 38° 05′ 24.60″. Longitude 114° 36′ 27.80.″]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
West Lava	60	40	28	240	29	45	4.46656	18.193
White Cliff	62	20	23	242	17	18	3.91569	5.117
Black Cliff	86	24	04	266	05	49	4.63714	26.946
Lava Tit	99	18	56	279	10	53	4.28637	12.015
Charcoal	101	05	25.43	281	02	20.65	3.8713584	4.621
Bailey	133	41	30.43	313	37	41.40	4.0965135	7.760
Fairview Peak	151	29	06	331	26	14	4.15174	8.812
Wilson	227	51	46.67	47	59	40.23	4.4002227	15.616
Parsnip	255	46	28.87	75	56	57.01	4.4075926	15.883
Danton	273	22	36	93	35	37	4.49007	19.205
Trestle	310	19	16.5	130	26	29.3	4.352131	13.979
Smelter	317	46	52.68	137	52	54.83	4.3296862	13.275
Ely	327	27	21.67	147	31	50.95	4.3135223	12.790

LAVA TIT, LINCOLN COUNTY, NEV. (Not occupied.)

A low lava summit at north end of Dry Lake Valley and about 5 miles southeast of Sharks Tooth. It is on the east edge of broad wash which enters Dry Lake Valley from the north.

Signal and station mark: Apparent highest point.

[Latitude 38° 07′ 05.4″. Longitude 114° 49′ 31.1″]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Bailey	241 11 34	61 15 49	4.05903	7.118
Jackrabbit	279 10 53	99 18 56	4.28637	12.015
Bristol	298 31 46	118 39 58	4.34445	13.734
Gap	308 54 42	129 03 48	4.42080	16.374
Highland	318 48 58	138 58 08	4.51870	20.514

LITTLE SUMMIT, LINCOLN COUNTY, NEV. (Not occupied.)

A rocky, sharp point on ridge about 5 miles east of Rose Valley. It is on south side of Modena-Rose Valley road and about 2 miles south from the point on this road locally known as Little Summit.

Signal and station mark: Apparent highest point.

[Latitude 37° 54′ 29.2″. Longitude 114° 08′ 18.0″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Highland	87 49 34	267 33 22	4.58790	24.088
Red Hill	89 14 32	269 03 53	4.40477	15.780
Red Butte	124 12 07	304 05 39	4.26964	11.561
Spring Valley	146 43 36	326 38 29	4.25193	11.099

LOW CONE, LINCOLN COUNTY, NEV. (Not occupied.)

A low red cone in the valley of Patterson Wash; it is on the east side of wash and about 6 miles northeast from Eightmile well.

Signal and station mark: Apparent highest point.

[Latitude 38° 03′ 45.3″. Longitude 114° 22′ 43.9″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Smelter	24 16 31	204 14 06	4.14633	8.704
Bristol	77 29 52	257 21 32	4.30670	12.591
Parsnip	206 52 31	26 54 31	4.01844	6.483
Spring Valley	281 03 06	101 07 53	4.06182	7.164

NORTH CONE, LINCOLN COUNTY, NEV. (Not occupied.)

The smaller and sharper of two cone-shaped hills about 7 miles northeast from Bristol Well and 8 miles northwest from Bristol Pass.

Signal and station mark: Apparent highest point.

[Latitude 38° 12′ 39.5″. Longitude 114° 40′ 21.4″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Wilson	261 53 06	82 03 25	4.39043	15.268
Parsnip	283 07 39	103 20 32	4.49544	19.444
Red Butte	306 13 28	126 26 45	4.59226	24.300
Smelter	325 30 58	145 39 25	4.54957	22.025

PAGE, LINCOLN COUNTY, NEV.

A three-point station to locate quarter corner.

On a cedar and nut-pine covered hill west of Page Creek and about half a mile north from the ranch of H. I. Olinghouse.

Station mark: Bronze triangulation tablet cemented in rock.

Signal: Pole and flag.

Reference marks: (A) Chiseled cross in rock distant from station mark 5.8 feet and in true azimuth 231° 10′; (B) chiseled cross in rock distant from station mark 46 feet and in true azimuth 298° 39′. Quarter-corner description is as follows: T. 4 N., Rs. 67 and 68 E., Mount Diablo meridian, quarter corner to secs. 19 and 24 is distant from Page triangulation station mark 485 feet and in true azimuth 272° 01′ 20″.

[Latitude 38° 11′ 34.72″. Longitude 114° 24′ 42.47″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Ely	12	04	01.58	192	01	26.32	4.4686326	18.280
Highland	23	48	31.85	203	42	22.83	4.5593252	22.525
Bristol	41	50	13.58	221	43	06.21	4.4035069	15.734
Wilson	195	17	28.58	15	18	06.33	3.7502913	3.496

PARSNIP, LINCOLN COUNTY, NEV.

On the rocky summit of Parsnip Mountain, Wilson Creek Range, in the northeast corner of T. 3 N., R. 68 E., Mount Diablo meridian. It is south from the head of Hultz Creek, on main divide between Patterson Wash and the Spring Valley drainage basin. It can be reached with animals by trail up the right fork of Hultz Creek (via the old Hultz ranch), then from the head of right fork follow ridge south to station.

Station mark: Bronze triangulation tablet cemented in rock.

Signal (U. S. Coast and Geodetic Survey station White Rock 1881 A): Rock cairn 10 feet high distant from station mark 8.2 feet and in true azimuth 335° 12′ 40″. (A large shapely mound of stone was found on Parsnip Peak, the upper portion partly destroyed. This was rebuilt and used as the signal for Parsnip station.)

Reference marks: (A) Chiseled cross in rock distant from station mark 13.6 feet; (B) chiseled cross in rock distant from station mark 23 feet.

[Position of U. S. Geological Survey tablet: Latitude 38° 08′ 47.11″; longitude 114° 19′ 30.21″. Position of U. S. Coast and Geodetic Survey cairn: Latitude, 38° 08′ 47.03″; longitude 114° 19′ 30.17.″]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Quarter Corner	13	29	51.33	193	28	44.97	4.0505959	6.982
Trestle	20	16	23.39	200	13	09.23	4.3461609	13.788
Smelter	25	25	06.39	205	20	41.62	4.3880550	15.184
Low Cone	26	54	31	206	52	31	4.01844	6.483
Ely	30	16	53.92	210	11	06.31	4.4364710	16.970
Highland	38	30	30.44	218	21	09.20	4.5533680	22.219
Eightmile	45	56	04.5	225	50	27.5	4.258202	11.260
Bristol	60	49	51.51	240	39	31.76	4.4481793	17.439
Jackrabbit	75	56	57.01	255	46	28.87	4.4075926	15.883
Bailey	94	08	34.86	273	54	17.00	4.5300638	21.078
Fairview Peak	101	15	32	281	02	11	4.50714	19.975
North Cone	103	20	32	283	07	39	4.49544	19.444
Wilson	150	02	16.61	329	59	41.27	4.0875365	7.601
Fogliani	298	24	16.10	118	30	13.58	4.2054444	9.972
Pioche (1883)	306	24	08.71	126	34	16.27	4.4753260	18.564
Spring Valley	330	13	13.42	150	16	00.22	4.1229931	8.248
White Rock (1883 U. S. Coast and Geodetic Survey)	335	12	40					[a] 8.2
Section Corner	350	35	43.97	170	36	39.83	4.1308522	8.398
Red Butte	356	22	38.85	176	23	04.47	4.2051928	9.967

[a] Feet.

PIOCHE, LINCOLN COUNTY, NEV.

A station of the U. S. Coast and Geodetic Survey on mountain locally known as Government Peak, about 2 miles southwest of State Line, Utah. About 33 miles by road and 22.5 miles direct in an easterly direction from the town of Pioche. The station is marked by a copper bolt leaded in a drill hole in solid bedrock. The station is nearly surrounded by a ring wall of rocks having an inner diameter of about 11 feet.

Four reference marks, each a drill hole in solid rock, are just outside the wall at the following distances and azimuths from the station: 2.52 meters, 214° 28′; 2.41 meters, 271° 38′; 2.72 meters, 344° 46′; and 2.35 meters, 92° 30′. Pioche latitude station, marked by a masonry pin, is 12.10 meters from the station in azimuth 135° 57′. The vertical circle station, nearly surrounded by a ring wall of rocks with an inner diameter of 8 feet, is 21.1 meters north-northwest from the station.

Station can easily be reached with animals from State Line, Utah.

[Latitude 37° 59′ 10.90″. Longitude 114° 03′ 04.82.″]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Bennett	69 39 19	249 20 36	4.67818	29.616
Gray Cone	73 58 47	253 45 39	4.51298	20.245
Highland (U. S. Geological Survey)	77 41 13.98	257 21 47.89	4.6760625	29.472
Ely	81 21 31.80	261 05 38.70	4.5829009	23.782
Smelter	83 00 11.47	262 45 40.96	4.5416715	21.628
Red Butte	94 26 45.09	274 17 04.07	4.3635618	14.352
Bristol	94 56 17.02	274 35 51.64	4.6877241	30.274
South Parsnip	119 18 38	299 09 45	4.38286	15.004
White Rock (1881 Coast and Geodetic Survey station)	126 34 07.95	306 24 00.39	4.4752941	18.563
Parsnip	126 34 16.27	306 24 08.71	4.4753260	18.564
Wilson	133 22 44.10	313 10 00.82	4.6167366	25.709
Fogliani	135 38 38.65	315 34 28.40	4.1510832	8.799

PIOCHE SCHOOL, LINCOLN COUNTY, NEV. (Not occupied.)

Cupola in the concrete school building in the town of Pioche.

Signal and station mark: Center of cupola.

[Latitude 37° 56′ 02.30″. Longitude 114° 26′ 59.78″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Ely	89 32 23.35	269 31 02.93	3.4467459	1.738
Bristol	126 05 11.62	306 00 29 97	4.2242785	10.414
Spring Valley	235 28 35.71	55 35 58.82	4.3285283	13.239

PIOCHE TANK, LINCOLN COUNTY, NEV. (Not occupied.)

Steel railroad water tank near the station, town of Pioche.

Signal and station mark: Center of tank.

[Latitude 37° 56′ 41.88″. Longitude 114° 26′ 19.42″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Ely	71 48 58.8	251 47 23.5	3.600041	2.350
Bristol	120 53 36.2	300 40 29.6	4.227982	10.504
Red Hill	347 03 40.7	167 04 06.5	3.661127	2.848

QUARTER CORNER, LINCOLN COUNTY, NEV.

Three-point station (checked).
Station mark: Quarter-section corner stone.
Signal: None.

[Latitude 38° 02′ 52.75″. Longitude 114° 21′ 17.76″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Ely	41	20	47.60	221	16	06.60	4.2273010	10.487
Bristol	82	48	34.48	262	39	21.67	4.3435441	13.706
Parsnip	193	28	44.97	13	29	51.33	4.0505959	6.982
Spring Valley	273	40	46.27	93	44	39.17	3.9654022	5.738

RED BUTTE, LINCOLN COUNTY, NEV.

A three-point station on the west summit of a large red butte (longest axis northeast and southwest) northeast from town of Pioche. It is north of the Eagle Valley-Pioche road and about 1.5 miles south of the Spring Valley-Pioche road.

Station mark: Bronze triangulation tablet cemented in rock.

Signal: Cedar tree, brushy top. Cairn around base and set off center 1 foot in the same azimuth as Pioche triangulation station.

Reference marks: (A) Chiseled cross in rock distant from station mark 7.4 feet and in true azimuth 45° 28′; (B) chiseled cross in rock distant from station mark 7.7 feet and in true azimuth 257° 04′.

[Latitude 38° 00′ 07.92″. Longitude 114° 18′ 48.67″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Red Hill	42	43	09.90	222	38	58.52	4.1678011	9.144
South Highland	34	47	07	214	38	10	4.57454	23.329
Gray Cone	37	23	23	217	19	55	4.13354	8.45
Highland	62	47	11.07	242	37	25.21	4.4179046	16.265
Ely	62	51	24.92	242	45	12.34	4.2206456	10.328
Bristol	95	13	13.23	275	02	28.89	4.4086835	15.923
Fairview Peak	124	24	57	304	10	42	4.59596	24.508
North Cone	126	26	45	306	13	28	4.59226	24.300
Parsnip	176	23	04.47	356	22	38.85	4.2051928	9.967
White Rock No. 2	184	23	05	4	23	32	4.13731	8.525
South Parsnip	190	57	42	10	58	31	4.00955	6.352
Spring Valley	231	12	06.58	51	14	28.5	3.8548731	4.448
Pioche	274	17	04.07	94	26	45.09	4.3635618	14.352
Little Summit	304	05	39	124	12	07	4.26964	11.561

RED HILL, LINCOLN COUNTY, NEV.

On summit of a red hill at south end of ridge of which Mount Ely is the north end. It is about 3 miles south from the town of Pioche and can be reached easily with animals from the Pioche-Panaca road.

Station mark: Bronze triangulation tablet cemented in rock.

Signal: Pine tree, brushy top, cairn around base and centered over station mark.

Reference marks: (A) Chiseled cross in rock distant from station mark 11.2 feet and in true azimuth 12° 45′; (B) chiseled cross in rock distant from station mark 28.1 feet and in true azimuth 119° 14′.

[Latitude 37° 54′ 17.01″. Longitude 114° 25′ 37.42″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
South Highland	29 39 30	209 34 44	4.36280	14.327
Bennett	56 43 18	236 38 26	4.14281	8.633
Highland	84 57 10.98	264 51 36.82	4.1252579	8.291
Ely	123 50 46.94	303 48 45.94	3.7626372	3.597
Smelter	162 12 45.66	342 12 07.31	3.6978051	3.099
Tank	167 04 06.54	347 03 40.72	3.6611270	2.848
White Rock	204 11 01	24 15 39	4.42915	16.692
Red Butte	222 38 58.52	42 43 09.90	4.1678011	9.144
Little Summit	269 03 53	89 14 32	4.40477	15.780
Gray Cone	269 43 03	89 43 46	3.23688	1.072
Bullionville	347 37 49.21	167 38 48.83	4.0451501	6.895

RIM, LINCOLN COUNTY, NEV. (Not occupied.)

A cone summit on the south end of a dark timbered hill on the rim of Salt Lake basin and about 20 miles southeast from the town of Pioche. It is about 6 miles south along the ridge from the point where the Modena-Rose Valley road crosses the summit.

Signal and station mark: Apparent highest point.

[Latitude 37° 48′ 50.2″. Longitude 114° 07′ 32.9″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Highland	102 43 37	282 26 57	4.61058	25.348
Ely	113 06 57	292 53 50	4.53179	21.141
Spring Valley	156 45 55	336 41 20	4.44131	17.165

SECTION CORNER, LINCOLN COUNTY, NEV.

A three-point station, on range line. T. 2 N., Rs. 68 and 69 E. Mount Diablo meridian, corner to sections 13, 18, 19, and 24 (properly marked). From cedar bearing tree in place (and properly marked).

Station mark: Section-corner rock.

Signal: None.

[Latitude 38° 01′ 34.61″. Longitude 114° 17′ 59.66″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Highland	59 06 54.93	238 56 38.75	4.4551548	17.721
Bristol	89 16 35.43	269 05 20.73	4.4267963	16.602
Parsnip	170 36 39.83	350 35 43.97	4.1308522	8.398
Spring Valley	247 32 28.76	67 34 17.85	3.6761674	2.948

SHARKS TOOTH, LINCOLN COUNTY, NEV. (Not occupied.)

A shark's tooth shaped butte on the Pahroc Range about 15 miles northwest from Bristol Well.

Signal and station mark: Apparent highest point.

[Latitude 38° 10′ 06.9″. Longitude 114° 54′ 51.4″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Wilson	259 41 57	80 01 13	4.66481	28.718
Bailey	270 11 49	90 19 21	4.25125	11.082
Bristol	300 38 22	120 49 51	4.50036	19.666
Highland	315 48 52	136 01 18	4.62754	26.357

SMELTER, LINCOLN COUNTY, NEV.

Brick chimney of Pioche smelter.
Station mark and signal: Center of chimney.

[Latitude 37° 56′ 51.01″. Longitude 114° 26′ 39.82″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Highland	63	16	35.15	243	11	39.18	4.1197226	8.186
Ely	65	06	21.24	245	04	58.55	3.5588492	2.250
Stampede	103	49	20.74	283	44	20.19	4.0892356	7.631
Bristol	120	50	11.74	300	44	17.77	4.2131998	10.152
Jackrabbit	137	52	54.83	317	46	52.68	4.3296862	13.275
Fairview Peak	143	21	03	323	11	37	4.54784	21.937
North Cone	145	39	25	325	30	58	4.54957	22.025
Low Cone	204	14	06	24	16	31	4.14633	8.704
Parsnip	205	20	41.62	25	25	06.39	4.3880550	15.184
Spring Valley	238	13	26.38	58	20	37.27	4.3027112	12.476
Pioche	262	45	40.96	83	00	11.47	4.5416715	21.628
Red Hill	342	12	07.31	162	12	45.66	3.6978051	3.099

SOUTH HIGHLAND, LINCOLN COUNTY, NEV. (Not occupied.)

The north summit of that part of the Highland Range which lies to the south of Bennett Pass.
Signal and station mark: Apparent highest point.

[Latitude 37° 43′ 26.9″. Longitude 114° 33′ 23.4″.]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Ely	195	45	47	15	48	32	4.38344	15.024
Red Hill	209	34	44	29	39	30	4.36280	14.327
Red Butte	214	38	10	34	47	07	4.57454	23.329
Spring Valley	217	14	31	37	25	49	4.64800	27.628

SOUTH PARSNIP, LINCOLN COUNTY, NEV. (Not occupied.)

A summit on the Wilson Creek Range, similar in shape but smaller and lower than Parsnip Peak. It lies to the west of Spring Valley and is 8 miles southeast of Parsnip Peak.
Signal and station mark: Apparent highest point.

[Latitude 38° 05′ 33.4″. Longitude 114° 17′ 28.9.″]

To station—	Azimuth.			Back azimuth.			Distance.	
	°	′	″	°	′	″	*Log. meters.*	*Miles.*
Red Butte	10	58	32	190	57	42	4.00955	6.352
Ely	43	32	19	223	24	17	4.38238	14.987
Bristol	74	20	36	254	10	02	4.45521	17.724
Pioche	299	09	45	119	18	38	4.38286	15.017
Spring Valley	326	47	05	146	48	37	3.82184	4.123

SOUTH RIM, LINCOLN COUNTY, NEV. (Not occupied.)

A dark timbered cone summit about 20 miles southeast from town of Pioche and about 7 miles south along ridge from the point where the Modena-Rose Valley road crosses the summit.
Signal and station mark: Apparent highest point.

[Latitude 37° 47′ 54.4″. Longitude 114° 08′ 30.0″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Highland	105 34 21	285 18 17	4.60052	24.767
Ely	116 45 13	296 32 42	4.52483	20.805
Spring Valley	160 40 17	340 36 18	4.45823	17.848

SPRING VALLEY, LINCOLN COUNTY, NEV.

On divide between Spring Valley and Patterson Wash. On the west point of a double summit. A red-rock, cedar-covered hill at the south end of the Wilson Creek Range. It is about 6 miles southwest from the Spring Valley ranch of Louis Fogliani; about 1.5 miles south from the Spring Valley-Pioche road and about 3 miles southwest of Danton Spring, from which it can be easily reached with animals.

Station mark: Bronze triangulation tablet cemented in rock.

Signal: Pine tree, brushy top, set off center 9.3 feet and in true azimuth 56° 37′.

Reference marks: (A) Chiseled cross in rock distant from station mark 11.3 feet and in true azimuth 155° 26′; (B) chiseled cross in rock distant from station mark 20.4 feet and in true azimuth 278° 41′.

[Latitude 38° 02′ 33.26″. Longitude 114° 14′ 59.85.″]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
South Highland	37 25 49	217 14 31	4.64800	27.628
Gray Cone	42 10 58	222 05 07	4.31398	12.803
Bennett	49 55 27	229 44 03	4.55089	22.092
Red Butte	51 14 28.53	231 12 06.6	3.8548731	4.449
Pioche School	55 35 58.82	235 28 35.71	4.3285283	13.240
Smelter	58 20 37.27	238 13 26.38	4.3027112	12.476
Ely	59 23 37.53	239 15 03.95	4.3743199	14.712
Section Corner	67 34 17.85	247 32 28.76	3.6761674	2.948
Bristol	86 04 35.30	265 51 29.70	4.4937948	19.37
Quarter Corner	93 44 39.17	273 40 46.27	3.9654022	5.738
Low Cone	101 07 53	281 03 06	4.06182	7.164
South Parsnip	146 48 37	326 47 05	3.82184	4.123
Parnsip	150 16 00.22	330 13 13.42	4.1229931	8.248
White Rock	153 48 05	333 46 10	4.01068	6.368
Fogliani	242 43 42.29	62 46 52.68	3.9278139	5.262
Pioche	289 37 47.02	109 45 07.38	4.2577687	11.511
Little Summit	326 38 29	146 43 36	4.25193	11.099
Rim	336 41 20	156 45 55	4.44131	17.165
South Rim	340 36 17	160 40 17	4.45823	17.848

STAMPEDE, LINCOLN COUNTY, NEV. (Not occupied.)

On summit of rocky hill at south end of Bristol Range, about 1 mile northeast of Stampede Gap. Can be reached with animals from the gap.

Station mark: Bronze triangulation tablet cemented in rock.

Signal: Pine tree, brushy top, cairn around base and centered over station mark.

Reference marks: (A) Chiseled cross in rock distant from station mark 11.5 feet, bears north; (B) chiseled cross in rock distant from station mark 11 feet, bears southeast.

[Latitude 37° 58′ 25.90″. Longitude 114° 34′ 48.42″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Gap	61 44 40.9	241 44 14.6	3.073252	0.736
Bristol	158 47 00.25	338 46 06.98	3.7658856	3.624
Smelter	283 44 20.19	103 49 20.74	4.0892356	7.631
Ely	297 12 33.56	117 16 11.34	3.9878050	6.042
Highland	358 53 31.08	178 53 35.39	3.9474219	5.505

TRESTLE, LINCOLN COUNTY, NEV. (Not occupied.)

The railroad trestle over Patterson Wash about 3 miles northeast from the town of Pioche.

Signal and station mark: Center of trestle.

[Latitude 37° 57′ 31.86″. Longitude 114° 24′ 45.17″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Bristol	112 56 21.8	292 49 17.2	4.261725	11.352
Jackrabbit	130 26 29.3	310 19 16.5	4.352131	13.979
Parsnip	200 13 09.2	20 16 23.4	4.346161	13.788

WEST LAVA, LINCOLN COUNTY, NEV. (Not occupied.)

The summit of a large hill on west side of and about 2,000 feet above Dry Lake Valley. It is about 20 miles west of Stampede Gap and lies south of and on the same ridge as Sharks Tooth.

Signal and station mark: Apparent highest point.

[Latitude 37° 57′ 38.2″. Longitude 114° 53′ 53.5″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Bailey	215 30 39	35 37 33	4.45144	17.570
Wilson	234 34 53	54 53 31	4.73298	33.599
Jackrabbit	240 29 45	60 40 28	4.46656	18.193
Bristol	254 56 19	75 07 09	4.42712	16.614
Highland	284 36 51	104 48 39	4.46376	18.076

WHITE CLIFF, LINCOLN COUNTY, NEV. (Not occupied.)

A light-colored summit on the foothills west of the Bristol Range. It is on west side of road from Bristol Well to Stampede Gap and about 3 miles southwest of Bristol Well. The summit breaks off abruptly on the west side, but on the east the slope is easy climbing for animals.

Signal and station mark: Apparent highest point.

[Latitude 38° 03′ 20.5″. Longitude 114° 41′ 27.0″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Bailey	172 00 43	351 59 59	4.09935	7.811
Jackrabbit	242 17 18	62 20 23	3.91569	5.117
Bristol	295 34 25	115 37 37	3.92620	5.242
Gap	317 58 34	138 02 14	4.11311	8.062
Highland	331 04 39	151 08 48	4.31156	12.732

WHITE ROCK NO. 2 (U. S. GEOLOGICAL SURVEY), LINCOLN COUNTY, NEV. (Not occupied.)

A sharp rocky summit on the Wilson Creek Range about 2 miles southeast from Parsnip Peak. It has large patches of light-colored rocks exposed on the south, east, and west slopes.

Signal and station mark: Apparent highest point.

[Latitude 38° 07′ 31.6″. Longitude 114° 18′ 05.6″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Red Butte	4 23 32	184 23 06	4.13731	8.324
Red Hill	24 15 39	204 11 01	4.42915	16.692
Ely	36 41 32	216 34 52	4.42345	16.474
Bristol	66 52 50	246 41 38	4.46075	17.951
Spring Valley	333 46 10	153 48 05	4.01068	6.368

WILSON, LINCOLN COUNTY, NEV.

On the west summit of Mount Wilson near north end of Wilson Creek Range, in T. 4 N., R. 68 E. Mount Diablo meridian. It is about 4 miles north from the 7L ranch, owned by H. I. Olinghouse, on Page Creek and can be easily reached with animals from this ranch.

Station mark: Bronze triangulation tablet cemented in rock.

Signal: Pine tree, brushy top, braced with poles and centered over station mark.

Reference marks: (A) Chiseled cross in rock distant from station mark 22 feet and in true azimuth 350° 05′; (B) chiseled cross in rock distant from station mark 16.9 feet and in true azimuth 52° 31′.

[Latitude 38° 14′ 30.76″. Longitude 114° 23′ 41.44″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Ely	12 35 42.43	192 32 29.43	4.5445520	21.772
Page	15 18 06.33	195 17 28.58	3.7502913	3.497
Eightmile	16 32 40.30	196 29 45.8	4.383987	15.043
Highland	22 40 39.09	202 33 52.16	4.6214328	25.989
Bristol	37 06 42.46	216 58 57.18	4.4837365	18.927
Jackrabbit	47 59 40.23	227 51 46.67	4.4002227	15.616
West Lava	54 53 31	234 34 53	4.73298	33.599
Black Cliff	72 34 48	252 08 39	4.81251	40.352
Bailey	73 33 26.35	253 21 42.98	4.4603818	17.936
Sharks Tooth	80 01 13	259 41 57	4.66481	28.718
North Cone	82 03 25	261 53 06	4.39043	15.268
Black Cone	85 52 09	265 33 50	4.63681	26.925
Fogliani	311 59 21.12	132 07 54.19	4.4350641	16.921
Pioche	313 10 00.82	133 22 44.10	4.6167366	25.709
Parsnip	329 59 41.27	150 02 16.61	4.0875365	7.601

NEW YORK, NEW JERSEY, AND PENNSYLVANIA.[1]

TRIANGULATION STATIONS.

Milford and White Lake quadrangles.

SULLIVAN COUNTY, N. Y.; SUSSEX COUNTY, N. J.; PIKE AND WAYNE COUNTIES, PA.

Triangulation control for above-named quadrangles was obtained in 1913 by George T. Hawkins. Positions are based upon Coast and Geodetic Survey stations Culvers Gap and High Point, N. J., North American datum.

CULVERS GAP, SUSSEX COUNTY, N. J.

A station of the United States Coast and Geodetic Survey on southwest side of Culvers Gap on ridge of Blue Mountains about 200 paces from its abrupt end at gap and 170 paces southwest from spot where recently stood tower, the location of which is well known in that region. The land is owned by estate of Capt. Robt. J. Holman, who lived at New Brunswick, N. J. Culvers Gap is about 3.5 miles from Branchville, on road to Milford, Pa. Branchville is nearest railroad station and can be reached by Sussex Railroad, a branch of the Delaware, Lackawanna & Western Railroad. To reach station proceed from "Mounted House" (a hotel just northwest of gap) toward Branchville, 0.25 mile to wood road near culvert, lead-off to right, and following this wood road around end and up side of mountain to "old tower" and thence along ridge of mountain to station.

Station mark: Copper bolt ¾ inch in diameter driven into rock even with its surface. Just west of bolt about 4 inches is an offset in ledge which rises 6 or 8 inches, upon which there is a cross cut.

Reference marks: Cross mark on ledge south 6 feet 4 inches; loose bowlder with cross mark northeast 16 feet 3 inches.

NOTE.—John Stepenfield, who lives on the east side of the mountain and found the bolt for Edwin Smith in 1908, and William V. Sutton, who lives at the Mountain House, and was lamp tender for Mr. Smith, know where the station is.

[Latitude 41° 10′ 21.060″. Longitude 74° 47′ 41.862″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Hamburg	276 51 31.19	97 01 57.87	4.3495179	.....
Mount Olive	348 41 03.72	168 44 13.74	4.5385140	.....
Montana	26 19 47.42	206 09 21.34	4.7032565	.....
Hilliard	143 45 29.53	323 39 57.14	4.2974507	12.325
Greening	150 10 44.20	330 04 44.78	4.4059640	15.824
Buck	172 28 44.24	352 27 12.72	4.3914970	15.305

[1] Additional data for New York are given on pages 479–492; for Pennsylvania on pages 493–496.

HIGH POINT, SUSSEX COUNTY, N. J.

A station of the United States Coast and Geodetic Survey on prominent projection of Blue Ridge, highest point in State, 4 miles south of Port Jervis, 3.5 miles northwest of Coleville, 1 mile north of (New Jersey) turnpike leading from Coleville to Port Jervis, on land owned by Mrs. C. S. Rutherford. To reach station leave above-mentioned turnpike on crest of mountain and follow well-conditioned road to "Little Pond" or Mascia Lake and thence along an indifferent road by shore of Pond to foot of High Point, and up hill by path to station.

Station mark: Copper bolt in ledge to within ½ inch of its end.

Reference marks: Cross on large bowlder 5 feet 10½ inches northeast; north 8 feet to cross mark cut in flat ledge; north 21 feet to south corner of tower.

NOTE.—James E. Fuller and Sheridan Bross, both living on mountain along turnpike, know where station is. Station was recovered in 1908; no reference marks were found, but bolt was in place and there is no doubt of recovery of station. The bowlder mentioned is there and not likely to be removed, but cross has been chipped off.

[Latitude 41° 19′ 15.225″. Longitude 74° 39′ 42.833″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Bear Fort	311 25 20.30	131 36 00.59	4.4802153	.....
Hamburgh	330 05 10.77	150 10 22.60	4.3448148	.....
Culvers Gap	34 08 12.03	214 02 56.17	4.2988189	.....
Hilliard	88 51 47.63	268 40 58.47	4.3593266	14.213
Greening	103 20 29.54	283 09 13.10	4.3883974	15.197
Buckhorn	118 59 47.97	298 52 59.76	4.2151097	10.197
McKinzie	144 20 15.12	324 14 21.48	4.3280216	13.224
Liberty	170 09 44	350 05 13	4.72032	32.634

LIBERTY, SULLIVAN COUNTY, N. Y. (Not occupied.)

The main tower of hotel on Walnut Hill near the town of Liberty.

[Latitude 41° 47′ 10.55″. Longitude 74° 46′ 11.64″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
McKenzie	5 37 00	185 35 43	4.53880	21.486
Weber	34 07 50	213 59 59	4.46610	18.174
Vine	56 38 54	236 22 51	4.60857	25.230
High Point	350 05 13	170 09 44	4.72032	32.634

McKENZIE, SULLIVAN COUNTY, N. Y.

South chimney on Mr. Ed. McKenzie's house, which is on high wooded knoll about 4 miles nearly north from Pondeddy and 12 miles northwest from Port Jervis. A good view in all directions.

Signal and station mark: Center of south chimney.

[Latitude 41° 28′ 35.37″. Longitude 74° 48′ 37.60″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Buckhorn	11 40 13.86	191 39 18.91	3.9794034	5.926
Bald	53 45 40.57	233 40 29.67	4.1312400	8.406
Vine	111 35 57.37	291 21 23.59	4.5163034	20.401
Weber	128 04 05	307 57 52	4.21852	10.277
Liberty	185 35 43	5 37 00	4.53880	21.486
High Point	324 14 21.48	144 20 15.12	4.3280216	13.224

WEBER, SULLIVAN COUNTY, N. Y.

About 7 miles east of Narrowsburg, 7 miles north of Lackawaxen, and 1.5 miles southwest of Four Corners at Beaver Brook post office on a low bald knob owned by Mr. George Weber and 60 yards west of his house. Good view except southeast.

Station mark: A triangulation tablet in stone in place 4 feet by 4 feet by 6 inches above ground.

Signal: Sawed lumber tripod.

Reference marks: Cross cut on rock in place 30 feet northeast.

[Latitude 41° 34′ 05.56″. Longitude 74° 57′ 59.60″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Vine	96 03 06	275 54 44	4.24568	10.940
Liberty	213 59 59	34 07 50	4.46610	18.174
McKenzie	307 57 52	128 04 05	4.21852	10.277

BALD, PIKE COUNTY, PA.

On a hill known locally as Bald Hill, about 10 miles southeast from Lackawaxen, and 2 miles northeast of Shohola Falls. Hill is covered with dense growth of scrub oak about 6 feet high and has few scattering dead pines. Good view in all directions except south. Mr. Jerry Greening, who lives near forks of road south of station, knows its location.

Station mark: Aluminum tablet cemented in rock in place 24 by 18 by 12 inches above ground on highest part of hill.

Signal: Targets in dead pine.

[Latitude 41° 24′ 15.88″. Longitude 74° 56′ 27.34″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Greening	7 01 08.77	187 00 55.93	3.5680145	2.298
Vine	135 35 17.67	315 25 55.74	4.4482938	17.444
McKenzie	233 40 29.67	53 45 40.57	4.1312400	8.406
Buckhorn	278 24 50.46	98 29 06.19	3.9581785	5.643

BUCKHORN, PIKE COUNTY, PA.

About 5 miles north of Milford and about 5 miles southeast of Pondeddy on point locally known as Buckhorn on State forest land and about 0.5 mile west of second-class road between Milford and Pondeddy.

Signal: A 12-inch pine trimmed up and white targets fastened about 20 feet from ground.

Station mark: Sandstone post 6 by 8 by 30 inches set 24 inches in ground with tablet cemented in top.

[Latitude 41° 23′ 32.62″. Longitude 74° 50′ 00.63″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Hilliard	45 14 55.94	225 10 54.51	4.0780056	7.436
Greening	76 08 00.48	256 03 31.98	3.9877724	6.041
Bald	98 29 06.19	278 24 50.46	3.9581785	5.643
McKenzie	191 39 18.91	11 40 13.86	3.9794034	5.926
High Point	298 52 59.76	118 59 47.97	4.2151097	10.197
Culvers Gap	352 27 12.72	172 28 44.24	4.3914970	15.305

GREENING, PIKE COUNTY, PA.

About 10 miles north of west from Milford on land owned by Jerry Greening and 0.5 mile southeast from his house on hill covered with scrub brush 6 feet high. From Milford follow pike leading to Shohola to Jerry Greenings then by old trail to point.

Mr. Greening knows location.

Signal: Sawed lumber tripod with targets.

Station mark: A sandstone block 10 by 12 by 30 inches set 26 inches in ground, cross cut on top.

Reference marks: Three piles of stone, one east 10 feet distant, one southwest 10 feet distant, one northwest 10 feet distant.

[Latitude 41° 22′ 16.89″. Longitude 74° 56′ 46.79″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Vine	141 01 18.94	320 52 10.06	4.4845337	18.962
Bald	187 00 55.93	7 01 08.77	3.5680145	2.298
Buckhorn	256 03 31.98	76 08 00.48	3.9877724	6.041
High Point	283 09 13.10	103 20 29.54	4.3883974	15.197
Culvers Gap	330 04 44.78	150 10 44.20	4.4059640	15.824
Hilliard	351 09 30.94	171 09 57.86	3.7901079	3.832

HILLIARD, PIKE COUNTY, PA.

About 10 miles nearly west from Milford on land owned by Mr. J. G. Hilliard and between the Log Cabin lakes about same distance from each. The point used is in the woods and across the big Log Cabin Lake from Mr. Hilliard's house, and is a lookout tower 40 feet high built of rough timber and has flag pole in center. To reach point from Milford, go 10½ miles on pike to fork of good private road, to Mr. Hilliard's house. From house row across lake about 0.25 mile, then by trail to tower.

Station mark: Sandstone post, 6 by 8 by 30 inches, set 25 inches in ground.

One inch hole 1 inch deep and cross cut across top.

Reference marks: 4 corners of tower 11 feet northwest, northeast, southwest, and southeast.

[Latitude 41° 18′ 59.35″. Longitude 74° 56′ 06.03″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Greening	171 09 57.86	351 09 30.94	3.7901079	3.832
Buckhorn	225 10 54.51	45 14 55.94	4.0780056	7.436
High Point	268 40 58.47	88 51 47.63	4.3593266	14.213
Culvers Gap	323 39 57.14	143 45 29.53	4.2974507	12.325

VINE, WAYNE COUNTY, PA.

About 7.5 miles southwest from Narrowsburg Mount, and 1.5 miles southwest from Beech Lake on land owned by Mr. Marshall and 0.25 mile southwest from his house, in cleared field on highest hill in neighborhood.

Signal: Sawed lumber tripod with targets.

Station mark: Aluminum Pennsylvania tablet in rock in place 8 by 4 feet, projecting 2.5 feet above ground.

Reference mark: Cross cut in rock in place 24 feet northeast from center. Signal over center.

[Latitude 41° 35′ 05.04″. Longitude 75° 10′ 35.48″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Liberty	236 22 51	56 38 54	4.60857	25.230
Weber	275 54 44	96 03 06	4.24568	10.940
McKenzie	291 21 23.59	111 35 57.37	4.5163034	20.401
Bald	315 25 55.74	135 35 17.67	4.4482938	17.444
Greening	320 52 10.06	141 01 18.94	4.4845337	18.962

PRIMARY TRAVERSE.

Hawley, Milford, and Wallpack quadrangles.

SUSSEX COUNTY, N. J.; SULLIVAN COUNTY, N. Y.; PIKE COUNTY, PA.

The following geographic positions on North American datum were determined by G. T. Hawkins in 1913, and are based on Hilliard, Greening, and McKenzie triangulation stations of the United States Geological Survey (see pp. 474, 476) and on triangulation station Culver Gap of the Coast and Geodetic Survey.

WALLPACK QUADRANGLE.

Along highways through northern part of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
NEW JERSEY.			
Culvers Gap, on southwest side of, on ridge of Blue Mountains, about 200 paces from its abrupt end at gap and 170 paces southwest from spot where recently stood tower, the location being well known in that region; copper bolt in rock with several reference marks near by (Coast and Geodetic Survey triangulation station Culvers Gap)	° ′ ″ 41 10 21.06	° ′ ″ 74 47 41.86	*Feet.*
Layton, 1 mile southeast of, 30 feet south to signboard; three corners	41 12 03.5	74 49 11.6	12,435
Layton post office, four corners at	41 12 55.3	74 49 39.2	5,653
Dingmans Ferry, 1 mile east of, near east end of iron bridge over Delaware River; three corners	41 13 12.5	74 51 25.0	8,274
PENNSYLVANIA.			
Dingmans Ferry, four corners at post office	41 13 23.2	74 52 17.2	4,127
Dingmans Ferry, 1.25 miles northwest of, 15 feet northwest to sign "Edgemere 6½ mi."; three corners	41 14 02.3	74 53 07.6	5,524
Dingmans Ferry, 2.5 miles northwest of, at white schoolhouse 25 feet northeast to signpost; four corners	41 14 10.2	74 54 29.0	6,270
Dingmans Ferry, 3.5 miles northwest of, 30 feet east to pine at corner of fence; second-class fork to north	41 14 37.6	74 55 20.9	4,840

Magnetic declination for north border of quadrangle, 8° 58′ W.

MILFORD QUADRANGLE.

Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
NEW YORK.			
Lackawaxen, 1.8 miles east of, 1,000 feet northeast to white house and barn; second-class fork north	° ′ ″ 41 28 47.3	° ′ ″ 74 57 22.3	*Feet.* 8,344
Barryville, 1 mile west of; bridge at mouth of hollow	41 28 58.7	74 55 56.1	6,674
Barryville, in west part of; four corners on towpath	41 28 42.9	74 55 25.2	2,851
Barryville, in east part of, 300 feet to church on hill; four corners on towpath	41 28 41.0	74 54 48.8	2,779
Barryville, 0.5 mile southeast of, at Dr. Ash's office; three corners	41 28 25.4	74 54 30.6	2,103
Barryville, 1.5 miles east of, 100 feet southeast to signpost; three corners	41 28 25.1	74 53 21.8	5,242
Proctor estate, southeast corner of, T road east at	41 29 07.5	74 52 13.8	6,729
Proctor estate, southeast corner of, 20 feet northwest to signpost; three corners at	41 29 29.0	74 50 28.8	8,290
Pond Eddy, 4 miles nearly north of, 12 miles northwest of Port Jervis, on high wooded knoll; center of south chimney on Mr. Ed. McKenzie's house (U. S. Geological Survey triangulation station McKenzie)	41 28 35.4	74 48 37.5	10,060

MILFORD QUADRANGLE—Continued.

Along highways near southwest corner and west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
PENNSYLVANIA.			
	° ′ ″	° ′ ″	*Feet.*
Hunting Tower Hotel, 0.25 mile east of, just east of sawmill; second-class T road north	41 15 08.6	74 56 53.8	.....
Silver Lake, 0.25 mile north of, 20 feet northwest to sign on tree "To Edgemere Club;" three corners	41 15 33.1	74 58 53.0	9,432
Silver Lake, 0.8 mile west of, 40 feet north of east-west road, 200 feet east to Ferdinand Frank's house, 160 feet east to Bushkill Creek, in solid rock; aluminum tablet stamped "Prim. Trav. Sta. No. 1, 1913"	41 15 32.0	74 59 47.4	4,149
Ferdinand Frank's house, 0.5 mile north of; forks in woods, roads north-northeast and south	41 15 53.8	74 59 43.7	2,229
Ferdinand Frank's house, 2 miles north of, 10 feet east to fire warning on red oak; forks in woods	41 16 41.8	74 58 24.6	7,753
Forks of Milford and Blooming Grove road and Dingman Pike, 200 feet south to signboard	41 17 54.5	74 57 44.4	7,974
J. G. Hilliard's house, 2 miles south of, private road at turnpike; three corners	41 18 00.6	74 55 58.7	8,100
Milford, 10 miles nearly west of, on land owned by Mr. J. G. Hilliard and between log cabin and lakes, about same distance from both; it is in woods and across Big Log Cabin Lake from Mr. Hilliard's house; cross cut in top of 6 by 8 by 30 inch sandstone post (U. S. Geological Survey triangulation station Hilliard)	41 18 59.5	74 56 06.2	5,985
Milford, 10 miles north of west from, on land owned by Jerry Greening and 0.5 mile southeast from his house on hill covered with scrub brush 6 feet high; cross cut on top of sandstone post (U. S. Geological Survey triangulation station Greening)	41 22 17.0	74 56 46.9	.....
Jerry Greening's house, 100 yards east of; three corners	41 22 43.6	74 57 03.8	2,984
Shohola Falls, 250 feet west of bridge at, 50 feet northwest to old house; three corners	41 23 21.7	74 58 21.0	7,033
Shohola Falls, 1.5 miles northwest of, road crossing old tramroad	41 24 21.8	74 58 53.5	6,568
Greely post office, road opposite	41 25 18.0	74 59 44.6	6,886
Lackawaxen, in wall east of frame house at south end of bridge over Delaware River, 20 feet southwest to front door of frame house; aluminum tablet stamped "Prim. Trav. Sta. No. 2, 1913"	41 28 55.0	74 59 11.4	.....

Magnetic declination for south border of quadrangle, 8° 58′ W.; for west border, 8° 49′ W.; for north border, 9° 24′ W.

HAWLEY QUADRANGLE.

Along highways near northeast corner of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Greely Meat Market; road opposite	41 26 06.1	75 00 10.4	.....
Greely Meat Market, 0.5 mile north of, 10 feet southeast to Kubler's mail box; T lane east	41 26 25.4	75 00 16.4	2,007
Lackawaxen, 2 miles southwest of, second-class forks to southeast	41 27 30.2	75 00 00.4	6,673

Magnetic declination for east border of quadrangle, 8° 49′ W.

NEW YORK.[1]

TRIANGULATION STATIONS.

Oneonta and Unadilla quadrangles.

DELAWARE AND OTSEGO COUNTIES.

Additional triangulation control for the above-named quadrangles was obtained in 1914 by George T. Hawkins. Three new stations were located, based on stations Butternut and Whitcomb (described in Bulletin 181), on North American datum.

BUTTERNUT, OTSEGO COUNTY, N. Y.

On a cleared knob in Butternut Township, on land owned by Walter Wood and occupied by Mr. Foote.

Station mark: A marble post 36 by 6 by 6 inches, set 32 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet marked "New York 517."

[Latitude 42° 27′ 58.70″. Longitude 75° 14′ 22.18″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Sidney	6 57 10.96	186 55 49.88	4.3575862	14.156
Palmer	41 06 10.51	221 02 35.62	4.0446156	6.886
Persons	303 59 43.53	124 07 16.70	4.2680993	11.520
Johnson	340 49 38.44	160 52 57.30	4.3134480	12.788
Willis	18 30 41.8	198 25 48.0	4.4986447	.....
Bobell	59 42 52.4	239 25 01.1	4.6251388	.....
Whitcomb	81 29 42.09	261 18 39.06	4.3560978	.....
Sherburne	140 03 35.8	319 55 51.7	4.3866556	.....
Telford	195 38 15.2	15 42 04.0	4.4555214	.....
Meredith	284 02 38.0	104 16 10.6	4.4531355	.....
Andes	303 06 51.2	123 27 10.9	4.6953369	.....

JOHNSON, DELAWARE COUNTY, N. Y.

In Franklin Township, 4 miles south of Franklin and 1.5 miles northeast of Merricksville, on bare hill owned by Mr. Johnson and about 400 feet east of his house.

Station mark: Marble post 6 by 6 by 26 inches set in ground. Tablet in top is 6 feet north of line fence crossing the hill.

Signal: Two-foot oak tree with target.

Reference marks: Fence line 6 feet south; signal tree southwest 28 feet.

Instrument over center, signal off center.

[Latitude 42° 17′ 28.60″. Longitude 75° 09′ 27.16″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Sidney	71 36 08.04	251 31 28.62	4.0014096	6.234
Palmer	128 20 47.52	308 13 54.27	4.2527007	11.119
Butternut	160 52 57.30	340 49 38.44	4.3134480	12.788
Persons	223 33 47.32	43 38 01.05	4.0972288	7.773

[1] Additional data for New York are given on pp. 473-478.

PALMER, OTSEGO COUNTY, N. Y.

About 3 miles northeast of Sidney and 1 mile southwest of Unadilla Center, on bare hill owned by Elmer Palmer and 300 yards southwest of his house.

Station mark: Marble post 6 by 6 by 26 inches, 24 inches in ground.

Signal: Sawed lumber tripod over center.

Reference marks: North-south rail fence, 128 feet west; corner of rail fence 155 feet east.

[Latitude 42° 23′ 27.94″. Longitude 75° 19′ 40.69″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Whitcomb	108 09 33.36	288 02 05.61	4.2032840	9.923
Butternut	221 02 35.62	41 06 10.51	4.0446156	6.886
Johnson	308 13 54.27	128 20 47.52	4.2527007	11.119
Sidney	342 19 47.53	162 22 00.98	4.1750740	9.299

PERSONS, DELAWARE COUNTY, N. Y.

On a round bare knoll in Franklin Township, on land owned by A. R. Persons (Treadwell post office).

Station mark: A bronze tablet cemented in solid rock 15 inches below surface of ground and covered with a small pile of flat stones.

[Latitude 42° 22′ 22.20″. Longitude 75° 03′ 10.38″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Johnson	43 38 01.05	223 33 47.32	4.0972288	7.773
Sidney	56 04 54.25	235 56 00.95	4.3400169	13.595
Butternut	124 07 16.70	303 59 43.53	4.2680993	11.520
Butternut[a]	124 07 36	304 00 03	4.26812	

[a] By McNair, 1900.

SIDNEY, DELAWARE COUNTY, N. Y.

Near north line of town of Masonville, Delaware County, 2 miles nearly south of village of Sidney Center, on land owned by Arthur Rudenbur. On north slope of hill which is timbered on top. Good view in all directions except from southeast to southwest.

Station mark: Marble post 6 by 6 by 26 inches, set 18 inches in ground. New York tablet in top.

Signal: Tripod of poles covered with white cloth.

Reference marks: 90 feet N. 20° (true) W. to edge of solid ledge; 115 feet N. 30° E. to old stump.

Instrument over center and under signal. Solid rock was struck under signal, stone projects 8 inches above ground, pile of stone around mark.

[Latitude 42° 15′ 45.77″. Longitude 75° 16′ 22.51″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Whitcomb	134 19 49.26	314 10 08.58	4.4004386	17.116
Palmer	162 22 00.98	342 19 47.53	4.1750740	9.299
Butternut	186 55 49.88	6 57 10.96	4.3575862	14.156
Persons	235 56 00.95	56 04 54.25	4.3400169	13.595
Johnson	251 31 28.61	71 36 08.04	4.0014096	6.234

WHITCOMB, CHENANGO COUNTY, N. Y.

On the south end of a hill in the town of Guilford and on the west side of north pond.

Station mark: A cut bluestone post 48 by 6 by 6 inches, set 36 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet marked "New York 518."

[Latitude 42° 26′ 08.71″. Longitude 75° 30′ 44.55″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Bobell	37 45 58.1	217 39 09.0	4.3564016	
Berry	130 56 19.9	310 49 06.8	4.2869704	
Sherburne	197 00 17.2	17 03 37.4	4.3629384	
Butternut	261 18 39.06	81 29 42.09	4.3560978	
Palmer	288 02 05.61	108 09 33.36	4.2032840	9.923
Sidney	314 10 08.58	134 19 49.26	4.4400486	17.116
Willis	334 41 21.3	154 47 29.00	4.4669983	

Canaseraga and Hornell quadrangles.

ALLEGANY AND STEUBEN COUNTIES.

Control for the above-named quadrangles was obtained in 1913 by George T. Hawkins, who extended triangulation from Nunda and Sandhill, described in appendix to Twenty-first Annual Report and in Bulletin 216, by occupying five new stations, all computed on North American datum.

BIRD, STEUBEN COUNTY, N. Y.

In town of Howard, about 9 miles northeast of Hornell and 3 miles northeast of Big Creek post office, on cleared hill on land owned by Mrs. Bird. There is a good view in nearly all directions except to the south.

Signal: A white target in apple tree.

Station mark: Tablet in top of marble post 6 by 8 by 24 inches set 24 inches in ground.

Reference marks: Apple tree 48 feet north; another apple tree 35 feet north.

[Latitude 42° 22′ 26.62″. Longitude 77° 32′ 33.64″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Sherwood	23 41 40.33	203 40 48.01	3.6457766	2.749
Johnson	50 09 00.80	230 02 37.11	4.2306653	10.568
Jersey	85 01 50.09	264 48 23.83	4.4391581	17.081

JERSEY, ALLEGANY COUNTY, N. Y.

In lot 5, town of Birdsall, on land owned by Mr. Young and about 300 yards southeast of his house in old orchard.

Signal: Sawed lumber tripod with targets and platform for instrument 20 feet high.

Station mark: A sandstone block 10 by 14 by 30 inches set 24 inches in ground with New York tablet in top.

Reference marks: Small apple tree near old one 24 feet southeast; apple tree 24 feet southwest.

[Latitude 42° 21′ 07.71″. Longitude 77° 52′ 30.18″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Marsh	167 23 02.80	347 21 40.29	4.1071070	7.952
Nunda	179 39 55.67	359 39 51.42	4.3905314	15.272
Sand	230 35 05.52	50 45 27.22	4.4350671	16.921
Bird	264 48 23.83	85 01 50.09	4.4391581	17.081
Johnson	300 30 22.45	120 37 24.34	4.2218890	10.357

JOHNSON, STEUBEN COUNTY, N. Y.

On land owned by Mr. Johnson, who lives about 5 miles southwest of Hornell, and is 0.25 mile north of his house on east-west fence line between two fields on highest hill in neighborhood. A good view in all directions.

Signal: Sawed lumber tripod with targets.

Station mark: A marble post 4 by 4 by 24 inches set 22 inches in ground with tablet in top.

Reference marks: Small apple tree 25 feet west; corner of north-south and east-west fences 235 feet east.

[Latitude 42° 16′ 33.01″. Longitude 77° 42′ 03.48″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Jersey	120 37 24.34	300 30 22.45	4.2218890	10.357
Sand	194 39 12.52	14 42 31.25	4.4249292	16.530
Bird	230 02 37.11	50 09 00.80	4.2306653	10.568
Sherwood	237 37 56.94	58 43 28.23	4.1204455	8.200

MARSH, ALLEGANY COUNTY, N. Y.

In lot No. 28, Grove Township, on land owned by E. N. Marsh, about 3.5 miles southwest of Swain, a station on the Erie Railroad. The station is the well, which is 150 feet southeast of Mr. Marsh's residence. A good view in all directions from windmill tower.

Signal: Windmill tower, 40 feet high.

Station mark: Center of well, 300 feet deep.

[Latitude 42° 27′ 52.42″. Longitude 77° 54′ 32.52″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Sand	258 35 05.99	78 46 50.99	4.3858191	15.107
Jersey	347 21 40.29	167 23 02.80	4.1071070	7.952

NUNDA, LIVINGSTON COUNTY, N. Y.

Situated in town of Nunda on highest part of what is locally known as East Hill.

Station mark: Bowlder 30 inches in diameter sunk flush with ground, in top of which is cemented a triangulation tablet. Station No. 514.

[Latitude 42° 34′ 24.22″. Longitude 77° 52′ 36.47″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Davis	78 25 47.18	258 10 54.79	4.4878673	.....
Carpenter	109 34 18.32	289 18 54.91	4.5179208	.....
Felch	128 32 12.16	308 26 02.46	4.2013176	.....
Perry	147 23 40.42	327 16 44.05	4.4136080	.....
Ridge	165 22 48.65	345 21 19.84	4.0730232	.....
Scottsville	196 00 33.60	16 07 21.29	4.6927834	.....
Conesus	228 43 06.21	48 52 44.48	4.4122965	.....
Springwater	251 22 43.10	71 37 21.95	4.4940585	.....
Sand Hill	288 58 56.92	109 09 24.17	4.3502399	.....
Jersey [a]	359 39 51.42	179 39 55.67	4.3905314	15.272

[a] By G. T. Hawkins in 1913.

SAND HILL, STEUBEN CUNTY, N. Y.

In the corner of field 0.1 mile southwest of farmhouse, on land owned by William Sanders, in town of Wayland, about 2 miles south of village of Perkinsville.

Station mark: A stone post 24 by 8 by 8 inches, set 24 inches in ground, in center of top of which is cemented a bronze tablet. Station number 512.

Mr. Hawkins in 1913 reported that stone mark has been destroyed. The point was identified by men who own the land. A new signal of sawed lumber erected on place identified as original position and marked by stone with New York tablet, 6 by 8 by 26 inches set 26 inches in ground. Reference marks: east-west fence 228 feet south; north-south fence 334 feet west.

[Latitude 42° 30′ 27.04″. Longitude 77° 37′ 08.72″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Johnson [a]	14 42 31.25	194 39 12.52	4.4249292	16.530
Jersey [a]	50 45 27.22	230 35 05.52	4.4350671	16.921
Marsh [a]	78 46 50.99	258 35 05.99	4.3858191	15.107
Nunda	109 09 24.17	288 58 56.92	4.3502399	.....
Springwater	206 05 08.98	26 09 19.48	4.2827117	.....
Cohocton	300 51 30.26	120 54 52.08	3.9004487	.....

[a] By G. T. Hawkins in 1913.

SHERWOOD, STEUBEN COUNTY, N. Y.

In town of Howard, about 6 miles nearly east from Hornell on a cleared hill which gives a good view in all directions except southeast. The station is on fence line on east side of Mr. Sherwood's property and about 300 yards northeast of his farmhouse and 250 yards north of Pike.

Signal: A group of four elm trees that grow so close together that the trunks touch.

Station mark: A marble post 6 by 8 by 24 inches set 20 inches in ground with New York tablet in top.

Reference marks: Cluster of four elm trees which touch each other 4 feet south; large bushy oak 130 feet south; rail fence 1 foot west.

[Latitude 42° 20′ 15.33″. Longitude 77° 33′ 51.29″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Johnson	58 43 28.23	238 37 56.94	4.1204455	8.200
Bird	203 40 48.01	23 41 40.33	3.6457766	2.749

Berne quadrangle.

ALBANY COUNTY.

In the fall of 1914 George T. Hawkins determined the position of a tablet set in a large bowlder in John Boyd Thacher Park. This point was occupied and located from Coast and Geodetic Survey station Helderberg and New York State Survey station Guilderland, on North American datum.

GUILDERLAND, ALBANY COUNTY, N. Y.

In Guilderland Township, on land owned by A. Van Hensen. About 200 yards south of four corners at hotel in Guilderland Center, on east side of road, in edge of orchard. Is granite post 8 inches square marked with "X" on top, "11" on south face, and "N. Y." on east face.

Signal: Tripod of sawed lumber with flag and target.

Station mark: Stone monument No. 11.

[Latitude 42° 42′ 02.298″. Longitude 73° 58′ 01.516″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Helderberg	23 46 08.08	203 44 21.71	3.9481223	5.514
Winne	118 15 04.32	298 12 00.50	3.8449722	4.348
Park	38 53 04	218 51 03	3.81093	4.020

HELDERBERG, ALBANY COUNTY, N. Y.

In New Scotland Township, on the highest part of Helderberg Mountain, in a field belonging to John Hallenbeck who lives at New Salem Village. Best approached from house of Garrett Flansburgh, whose lands adjoin. Eight and one-half miles from New Scotland depot and 5 miles from New Salem. Summit covered with growth of small birch, pine, and basswood.

Underground mark: A stone jug 2 feet below surface.

Station mark: A granite post 6 by 6 by 30 inches set 24 inches in ground.

Reference marks: Granite posts set 7 feet north, south, east, and west of center.

[Latitude 42° 37′ 39.072″. Longitude 74° 00′ 38.487″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Rafinesque	240 47 42.718	61 03 45.635	4.5677959	.....
Greylock	268 49 12.873	89 23 31.424	4.8404909	.....
Winne	167 13 04.85	347 11 47.56	4.0690359	7.284
Sittles Hill	170 10 49.17	350 09 47.57	4.0834815	7.530
Guilderland	203 44 21.71	23 46 08.08	3.9481223	5.514
Hamiltonville	219 36 52.80	.....	4.0654066	7.224
Park	171 01 59	351 01 44	3.49452	1.940

PARK, ALBANY COUNTY, N. Y.

Park is about 5 miles nearly south from Altamont and is in the John Boyd Thatcher park near edge of cliff at the pincic grounds and 200 feet southeast of where county road comes to top of hill through rock walls.

Station mark: Tablet set in granite bowlder about 4 by 3 by 6 feet bedded in ground about 2 feet, marked "John Boyd Thacher Park. Latitude, 42° 39′ 19″; longitude, 74° 01′ 00″. Elevation above sea 1,125.6 feet. Determined by U. S. Geological Survey, 1914."

Signal: Tripod of poles with flag and target.

Reference marks: Edge of bluff 45 feet east; large granite bowlder in place 215 feet south.

[Latitude 42° 39′ 19.045″. Longitude 74° 00′ 59.863″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Guilderland	218 51 03	38 53 04	3.81093	4.020
Helderberg	351 01 44	171 01 59	3.49452	1.940

PRIMARY TRAVERSE.

Cranberry Lake, Number Four, Oswegatchie, and Russell quadrangles.

HERKIMER AND ST. LAWRENCE COUNTIES.

The following geographic positions on North American datum were determined in 1913 by S. S. Gannett and are based on points located by primary traverse at Bacon, Pond Settlement Schoolhouse, and at outlet of Greggs Lake in 1910 and 1911, published in Bulletins 496 and 551.

CRANBERRY LAKE QUADRANGLE.

[See also p. 487.]

Along New York Central & Hudson River Railroad near northwest corner of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Benson Mines, 0.6 mile northeast of; road crossing	44 10 33.4	74 59 39.6	.....
Road crossing, Benson Mines-Newton Falls, milepost No. 74 is 105 feet northwest	44 11 33.8	74 59 19.1	6,296
Newton Falls, 23 feet south of southeast corner of station, 12 feet north of side track, in granite bowlder; bronze tablet stamped "Prim. Trav. Sta. No. 3 1913"	44 12 43.6	74 59 32.8	7,139

RUSSELL QUADRANGLE.

[See also pp. 487–488.]

Along highways near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Fine, 1.5 miles northwest of; creek crossing	44 15 21.1	75 09 52.5	.....
Forks of road opposite sugar camp	44 15 37.9	75 10 56.2	4,939
T road northeast	44 16 20.3	75 11 52.0	5,911
South Edwards, 0.3 mile northeast of; junction of north-south road	44 16 17.9	75 12 19.0	1,985
South Edwards; T road south	44 16 02.7	75 12 30.4	1,747
Forks of road northeast and northwest	44 15 53.0	75 12 33.2	1,001
Pond Settlement schoolhouse, near, in solid rock in southwest corner of T road south, 30 feet south of center of triangle at three corners and 80 feet south of northeast corner of schoolhouse; aluminum tablet stamped "Prim. Trav. Sta. No. 5 New York 1912"	44 15 36.7	75 13 22.0	3,915

OSWEGATCHIE QUADRANGLE.

Along New York Central & Hudson River Railroad from Kalurah to Benson Mines.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Road crossing	44 09 55.7	75 14 07.3	.....
Kalurah, west of station; road crossing	44 09 35.7	75 12 39.2	6,732
Long Lake, 300 feet southwest of; road crossing	44 09 32.1	75 12 21.3	1,350
Creek crossing	44 09 15.5	75 12 18.9	1,693
Jayville station	44 09 23.3	75 11 20.2	4,353
Milepost No. 61, center of track opposite	44 09 50.8	75 09 42.6	7,639
Bear Lake, 1,000 feet northeast of; road crossing	44 09 43.4	75 09 24.9	1,487
Briggs station, track opposite sawmill	44 09 52.1	75 09 17.1	5,019
Milepost No. 63, center of track opposite	44 09 24.0	75 08 11.2	2,874
Road crossing	44 09 30.7	75 07 16.0	4,077
Aldrich, center of track in front of station	44 08 57.1	75 06 37.1	4,428
Aldrich, highway bridge over Little River on north side of west abutment; chisel mark	44 08 55.2	75 06 21.9	1,123
Aldrich, 0.3 mile east of station, in southwest corner of abutment of railroad bridge over Little River, 1 foot from edge of abutment, 86 feet west of center of bridge; bronze tablet stamped "Prim. Trav. Sta. No. 1 1913"	44 09 00.2	75 06 24.8	548
Road crossing	44 09 37.0	75 06 18.1	3,759
Milepost No. 66, center of track opposite	44 09 49.6	75 06 08.1	1,463
Coffins Mills, north-south road crossing	44 10 20.6	75 05 09.6	5,293
Oswegatchie, 135 feet east of station, north-south road crossing	44 10 57.0	75 04 16.3	5,354
Road crossing; road southeast and northwest	44 10 48.8	75 02 55.0	5,981
Milepost No. 70, 1,210 feet east of; road crossing	44 10 42.0	75 01 59.8	4,084
Milepost No. 71, 150 feet northwest of; road crossing	44 10 33.9	75 01 13.5	3,472
Benson Mines, 188 feet northeast of station, in concrete base of water tower; bronze tablet stamped "Prim. Trav. Sta. No. 2 1913"	44 10 11.6	75 00 09.1	5,202

OSWEGATCHIE QUADRANGLE—Continued.

Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Opposite Mr. Schuyler's house	44 12 36.1	75 00 24.5	
Opposite Wm. Perrigo's house	44 12 37.6	75 00 39.4	1,094
Creek crossing	44 12 27.0	75 00 53.3	1,480
Opposite Louis Costos's house	44 12 14.0	75 01 40.3	3,669
F. C. Kilbourne's house, 80 feet northwest of, 50 feet north of road west; road north-south	44 11 32.4	75 02 58.5	7,087
Schoolhouse (District No. 10), 370 feet northwest of; junction with main road northeast-southwest	44 12 38.4	75 03 11.3	6,748
Oswegatchie River, center of iron bridge over	44 12 52.0	75 02 58.8	
Forks of road	44 12 54.5	75 03 14.6	1,647
Opposite cemetery	44 13 45.6	75 04 31.2	7,605
Creek crossing	44 14 14.6	75 05 25.9	4,951
Road forks, southwest, 225 feet northwest of schoolhouse, 300 feet north of iron bridge	44 14 21.4	75 05 36.8	1,052
Road forks	44 14 30.6	75 07 07.6	6,648
Fine, east end of village, 50 feet east of T road north, on north side of road, in large bowlder; bronze tablet stamped "Prim. Trav. Sta. No. 4, 1913"	44 14 47.6	75 08 02.2	4,359
Fine, center of	44 14 52.5	75 08 22.6	1,569

Along highways near east border of quadrangle from Benson Mines south to Chartrand Camp.

Benson Mines, in front of post office; center of road forks	44 10 02.8	75 00 04.6	
Forks of road southwest	44 09 49.6	75 00 43.7	3,150
Grove Hotel, forks of road	44 09 41.3	75 01 52.6	5,089
Star Lake, 30 feet southeast of post office; triangular plot at road intersection	44 09 35.5	75 02 05.0	1,078
Little River, center of bridge over	44 08 36.5	75 01 40.8	6,231
Forks of road, Joe Fournier's house is 60 feet northeast	44 08 11.5	75 01 38.7	2,530
Tamarack Creek, center of corduroy bridge over	44 08 10.7	75 02 10.9	2,354
Decass Old Camp, small creek southeast	44 07 38.0	75 02 46.6	4,210
Summit of flat ridge	44 07 00.3	75 03 14.3	4,315
Streeter Lake, bridge over outlet from	44 06 52.0	75 03 17.6	873
Balls Camp, forks on left road to, right road to Francis Camp	44 06 42.7	75 03 22.7	1,016
Old road west	44 06 32.5	75 03 34.7	1,356
Creek crossing	44 05 51.0	75 03 44.1	4,258
Middle branch of Oswegatchie River, east bank of bend where tote road runs along river	44 05 00.6	75 04 01.4	5,256
Francis Camp, west end of bunk house	44 04 39.9	75 04 00.0	2,093
Francis Camp, 650 feet south of, 20 feet east of road in large granite bowlder; bronze tablet stamped "Prim. Trav. Sta. No. 5 1913"	44 04 34.5	75 03 58.3	558
Stream northwest	44 04 09.0	75 03 49.2	2,667
Corduroy bridge (200 feet long) over small creek	44 03 18.1	75 03 54.4	5,174
St. Lawrence-Herkimer county line, iron post 300 feet northwest of stone monument, stamped "St. Lawrence County 1903—Macomb Purchase G. T. tract No. 4" on one side and "Herkimer County 1903 T & C. Purchase 0.05 mile" on other	44 03 04.0	75 03 51.2	1,443
St. Lawrence-Herkimer county line, angle; granite monument 4 feet high, 12 inches square, marked "St. Lawrence County" on one side and "Herkimer County" on other, northwest corner of Totten and Crossfield purchase	44 03 02.5	75 03 47.7	298
Alder Bed Driving Camp, log bridge over Middle Branch of Oswegatchie River	44 02 45.8	75 03 49.6	1,699
Alder Bed Driving Camp, opposite bunk house	44 02 39.9	75 03 48.6	601
Alder Bed Driving Camp, 0.9 mile southeast of, road opposite old log pile	44 02 01.4	75 03 03.4	5,110
North summit of flat ridge	44 01 53.0	75 03 04.2	852
Alder Bed Driving Camp, 1.8 miles south of, at summit of ridge, on large flat granite rock at edge of road, maple tree 15 feet south, blazed on three sides, beech tree opposite; bronze tablet stamped "Prim. Trav. Sta. No. 6, 1913"	44 01 26.5	75 03 14.3	2,779
Corduroy bridge over drain	44 00 45.4	75 03 35.5	4,445
Chartrand Camp, bunk house peak northwest corner	44 00 38.8	75 03 37.8	679

Magnetic declination for north border of quadrangle, 11° 46′ W.; for east border, 12° 40′ W.

NUMBER FOUR QUADRANGLE.

Along highways near northeast corner of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Middle Branch of Oswegatchie River, bank	43 59 53.0	75 03 42.1	.....
Forks of road southwest	43 59 36.0	75 03 41.0	1,719
Bridge over Greggs Lake outlet (center of creek)	43 59 38.3	75 03 34.6	524

Magnetic declination near northeast corner of quadrangle, 12° 40′ W.

Cranberry Lake, Russell, and Stark quadrangles.

ST. LAWRENCE COUNTY.

The line starts from Hermon street corners established by primary traverse and follows highways eastward near north border of quadrangle and is tied to Stark triangulation station described in Bulletin 201. Thence along highways via Clare, Degrasse, and Russell to starting point. Starting from adjusted position on main circuit at Degrasse, follows highways to New Bridge, thence south along log railroad to Newton Falls, and is tied to primary traverse position at that place, described on page 485, North American datum. This work was done by George T. Hawkins in 1914.

CRANBERRY LAKE QUADRANGLE.

[See also p. 485.]

Along log railroad near northwest corner of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Newton Falls, 3 miles northeast of, railway track where trail starts east through woods	44 14 48.1	74 57 38.2	.....
Newton Falls, 1 mile northeast of, switch block at head of blind siding	44 13 34.3	74 58 54.8	9,321
Newton Falls, 23 feet south of southeast corner of station, 12 feet north of sidetrack, in granite bowlder; bronze tablet stamped "Prim. Trav. Sta. No. 3 1913"	44 12 43.6	74 59 32.8	5,822

RUSSELL QUADRANGLE.

[See also p. 485.]

Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Hermon, cross streets at hotel	44 28 01.1	75 13 52.8	.....
Hermon, 1.5 miles east of, T road south, 150 feet southwest to small brick house	44 28 12.0	75 12 15.5	7,144
Hermon, 2.5 miles east of, iron bridge over Grasse River, west end of	44 28 00.1	75 11 03.5	5,361
Hermon, 4 miles east of, 4 corners, 120 feet southwest to schoolhouse, 100 feet northeast to house	44 28 06.2	75 09 23.7	7,270
Hermon, 5.5 miles east of, and 3 miles south of North Russell, on south side of east and west road, and 700 feet east of J. C. Smith's house, cemented in large granite bowlder in place; bench-mark tablet stamped "Prim. Trav. Sta. No. 5, 1914"	44 28 12.2	75 07 39.6	7,572
Three corners, 20 feet southwest to mail box	44 28 38.0	75 05 40.8	9,011
Three corners, 40 feet south to 14-inch elm tree	44 29 16.3	75 05 15.5	4,293
Red schoolhouse, crossroads 120 feet east of	44 28 41.6	75 04 18.4	5,432
West Pierpont, T road east at, 30 feet southeast to cheese factory, 30 feet west to store	44 29 32.9	75 03 37.6	5,976
West Pierpont, 1 mile east of, T road south, 250 feet northwest to barn	44 29 38.2	75 02 22.4	5,481
West Pierpont, 2.5 miles east of, on south side of road, set in south rail of concrete bridge; bench-mark tablet stamped "Prim. Trav. Sta. No. 6, 1914"	44 29 15.6	75 00 48.7	7,164

RUSSELL QUADRANGLE—Continued.

Along highways near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Clare, 2 miles east of, wooden bridge on tote road, notch cut on each side	44 26 02.6	75 01 30.8	.....
Clare, T road east at, 300 feet southeast to townhouse, 400 feet southwest to schoolhouse	44 26 09.0	75 03 23.1	8,180
Clare, 1 mile south of, 30 feet northwest to bars, T road west	44 25 21.8	75 03 19.8	4,774
Clare, 2 miles south of, county road opposite creamery door	44 24 27.9	75 03 37.5	5,602
Clare, 3 miles south of, second-class road west, 400 feet west to gate	44 23 21.7	75 03 56.1	6,834
Clare, 3.5 miles south of, 2.5 miles north of Degrasse, 650 feet north of iron bridge over Grasse River; bench-mark tablet set in north side of concrete bridge, stamped "Prim. Trav. Sta. No. 7, 1914"	44 22 38.3	75 03 41.4	4,518
Degrasse, 1 mile northeast of, turn in road, 50 feet southwest to windmill, 20 feet south to culvert	44 21 42.5	75 03 52.5	5,696
Degrasse, 0.25 mile northeast of, three corners	44 21 05.9	75 04 25.0	4,393
Degrasse, 2 miles southeast of, three corners, 300 feet west to bridge over Grasse River	44 20 16.9	75 02 39.4	9,132
Rainbow Falls, county road opposite log hotel at	44 20 03.6	75 01 35.2	4,852
Rainbow Falls, 1 mile southeast of, concrete bridge with high concrete rails	44 19 44.6	75 00 28.6	5,211

Along highways diagonally northwest through quadrangle.

Degrasse, county road opposite entrance to hotel	44 20 58.4	75 04 36.3	.....
Degrasse, 1.5 miles northwest of, T road northeast, 150 feet west to house	44 21 27.9	75 06 07.6	7,268
Old mill, three corners at	44 21 50.0	75 07 00.2	4,426
Degrasse, 3.5 miles northwest of, large granite bowlder in place on south side of road and 30 feet southeast of three corners, and 100 feet northwest of house, 80 feet southwest of house has bench-mark tablet cemented in top and marked "Prim.Trav.Sta.No.8, 1914"	44 22 16.3	75 07 38.9	3,865
Chase factory, T road northeast, 500 feet southeast of	44 22 54.4	75 08 22.3	4,976
Burnt house, three corners, 200 feet southeast of	44 24 12.3	75 09 17.8	8,851
Russell, south end of iron bridge across Grasse River at	44 25 38.6	75 08 59.3	8,841
Russell, 1.5 miles northwest of, county road opposite water trough, 50 feet north to barn	44 26 21.5	75 10 24.6	7,551
Hermon, 2 miles southeast of, county road between house and barn owned by Mr. Louck	44 26 45.4	75 11 34.7	5,627
Hermon, 1.5 miles southeast of, crossroads at schoolhouse	44 27 07.5	75 12 12.9	3,550
Hermon, cross streets at hotel	44 28 01.1	75 13 52.8	9,048

Magnetic declination for north border of quadrangle, 11° 27′ W.; for east border, 11° 48′ W.; near center, 11° 27′ W.

STARK QUADRANGLE.

Along highways near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Sellecks four corners, 40 feet northeast to store	44 29 17.3	74 59 04.5	.....
T road west, 400 feet northwest to house	44 29 28.5	74 57 57.3	5,009
Three corners, 400 feet northwest to house	44 28 00.5	74 57 06.1	9,654
Stark triangulation station, on a timbered ridge in northeast corner of town of Clare, on the west side of the North Branch of the Grasse River, on land owned by Irving Stark, theodolite elevated 52 feet on a tower built around trunk of a beech tree; bronze triangulation tablet cemented in solid rock	44 27 11.69	74 57 52.9	5,992
Stark triangulation station, 2 miles southwest of, three corners in woods 20 feet west to blazed tree	44 26 29.8	74 59 25.1	7,911
Sam Starks cabin, twin maple trees in front of	44 26 26.2	74 59 54.9	2,175
Rainbow Falls, 2 miles southeast of, second-class fork to east, 30 feet south to large maple tree	44 19 07.6	74 59 56.1	
Rainbow Falls, 3 miles southeast of, concrete bridge at log camp	44 18 18.9	74 59 41.1	5,048
New Bridge, 1.25 miles northwest of, county road crossing log railroad	44 17 57.3	74 59 19.7	2,676
New Bridge, 0.75 mile northwest of, second-class road east, signboard reads "Spicer's Camp, 3 miles"	44 17 32.0	74 58 45.8	3,547
New Bridge, west end of iron bridge at	44 17 10.3	74 58 35.0	2,337

STARK QUADRANGLE—Continued.

Along log railroad near southwest corner of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
New Bridge, 1.75 miles southeast of, small fill on railway, notches cut in stringers on both sides of track	44 16 23.0	74 57 28.8	6,782
New Bridge, 2 miles southeast of, railway track opposite north end of old hunting shack	44 16 02.0	74 57 31.2	2,125
New Bridge, 3 miles southeast of, railway track crossing creek	44 15 11.5	74 57 46.1	5,215

Magnetic declination near west border of quadrangle, 11° 48′ W.

Chateaugay, Loon Lake, Malone, Moira, Nicholville, and Santa Clara quadrangles,

FRANKLIN AND ST. LAWRENCE COUNTIES.

The following geographic positions were determined by primary traverse and are upon North American datum. The work was done by George T. Hawkins in 1914. Lines run by E. L. McNair in 1900 in Malone and Moira quadrangles, described in Bulletin 181, have been readjusted and are included.

CHATEAUGAY QUADRANGLE.

On highway near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Salmon River, 1 mile west of, 100 feet east of house, T road southwest	44 45 07.0	74 14 09.6	.....

Magnetic declination, 11° 33′ W.

LOON LAKE QUADRANGLE.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Owls Head station, 0.75 mile north of, railroad crossing	44 44 33.2	74 10 32.9	.....

MALONE QUADRANGLE.

Along highways near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Wooden bridge, 80 feet southeast to old house (magnetic declination, 9° 20′ W.)	44 45 41.9	74 17 27.5	7,141
T road west, 40 feet west to iron bridge (magnetic declination, 9° 43′ W.)	44 46 47.1	74 18 22.1	7,690
Four corners, 40 feet west to three mail boxes (magnetic declination, 10° 10′ W.)	44 46 44.2	74 19 29.8	4,890
T road east, 30 feet northwest to three mail boxes (magnetic declination 11° 38′ W.)	44 46 41.7	74 20 25.3	4,010
T road west, 70 feet southwest to log house (magnetic declination, 11° 45′ W.)	44 46 09.3	74 20 21.4	3,298
Three corners, 20 feet southwest to maple tree (magnetic declination, 11° 55′ W.)	44 45 50.9	74 21 19.0	4,550

MALONE QUADRANGLE—Continued.

Along highways near south border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Skerry, 0.20 mile east of, 300 feet south of T road west, on west side north and south road, 15 feet west of road, in large granite bowlder; tablet marked "Prim. Trav. Sta. 1914" (magnetic declination, 11° 55′ W.)	44 46 00.9	74 22 55.4	7,030
T road south, 150 feet southwest to house	44 46 33.9	74 22 59.6	3,359
Four corners, 70 feet northeast to church, 80 feet southwest to church, 100 feet southeast to schoolhouse (magnetic declination, 0° 25′ W.)	44 46 27.0	74 24 44.7	7,616
Four corners, 120 feet southwest to red house	44 46 23.1	74 25 53.0	4,940
Crossroad, 20 feet southeast to telegraph pole	44 46 20.4	74 27 12.1	5,713
T road north, 15 feet north to mail box	44 46 14.5	74 28 25.5	5,329
Skerry, about 2.8 miles west of, in south abutment of concrete bridge over small stream; tablet marked "Prim. Trav. Sta. No. 2, 1914"	44 46 12.9	74 28 46.8	1,546
T road east, 20 feet east to mail box (magnetic declination, 1° 10′ W.)	44 46 11.8	74 29 06.9	1,450
T road south, on State road, 400 feet northeast large house	44 47 04.8	74 29 14.2	5,389
East Dickinson, T road north at	44 46 46.8	74 29 54.9	3,458

Along highways near west border of quadrangle.

T road west, 160 feet northwest to schoolhouse	44 51 42.4	74 29 59.3	.....
Turn in road, 20 feet east to Mr. Keifer's mail box (magnetic declination, 13° 11′ W.)	44 57 30.0	74 29 44.1	.....
Crossroads, 70 feet northwest to brick house	44 58 02.4	74 29 36.4	3,324
Fort Covington, in southwest part of, three corners, 70 feet southeast to sign "Brushton 12 miles" (magnetic declination 12° 40′ W.)	44 59 11.6	74 29 45.9	7,041
Fort Covington, 900 feet east of Grand Trunk Ry. station, road crossing	44 59 52.19	74 29 36.8	4,155

Along Ogdensburg & Lake Champlain Railway from Brushton to Malone.

Brushton station, road crossing, 245 feet east of	44 49 48.6	74 30 32.9	.....
Road crossing, 110 feet west of milepost 65	44 50 24.9	74 27 00.2	.....
Bangor station, road crossing, 100 feet west of	44 51 05.2	74 24 11.2	.....
Road crossing, 620 feet west of milepost 60	44 51 30.9	74 21 35.8	.....
Overhead road crossing, 1,580 feet east of milepost 58	44 51 39.5	74 18 45.3	.....
Malone station, center of	44 50 58.3	74 17 34.2	.....
Malone Junction, crossing of Ogdensburg & Lake Champlain and Mohawk & Malone railways	44 51 30.4	74 16 30.0	.....
Malone, Franklin County fair grounds, south meridian monument [a]	44 50 48.4	74 16 41.4	.....
Malone, Franklin County fair grounds, north meridian monument [a]	44 50 58.1	74 16 41.4	.....

[a] These meridian marks are on a spur of both Kendall's and McNair's traverse. Kendall's values accepted.

MOIRA QUADRANGLE.

Along Rutland Railroad from milepost 79 to Brushton.

Station.	Latitude.	Longitude.
	° ′ ″	° ′ ″
Road crossing 1,120 feet east of milepost 79	44 47 58.2	74 43 09.8
Road crossing 960 feet east of milepost 77	44 48 12.6	74 40 46.6
Road crossing 1,965 feet west of milepost 75	44 48 25.1	74 39 02.2
Road crossing 2,070 feet east of milepost 74	44 48 49.6	74 36 57.7
Moira station, road crossing 185 feet west of	44 49 31.3	74 33 25.3
Moira station, about 1,130 feet east of, in rocky pasture about 95 feet south of the center of railway track; a bronze triangulation tablet set in rock outcrop about 1 foot above surface of ground, 70.5 feet from corner of pasture	44 49 33.7	74 33 07.4
Moira station, about 2,100 feet east of, in rocky pasture about 79 feet south of center of railway track; a bronze triangulation tablet set in bowlder about 5 feet by 2 feet 6 inches above ground. (Tablets 972.65 feet apart)	44 49 36.3	74 32 54.7
Brushton station, road crossing, 245 feet east of	44 49 48.6	74 30 32.9

MOIRA QUADRANGLE—Continued.

Along Grand Trunk Railway from Massena Springs to Bombay.

Station.	Latitude.	Longitude.
	° ′ ″	° ′ ″
Center of bridge, 330 feet east of milepost 94	44 55 22.9	74 50 44.2
Road crossing 2,480 feet east of milepost 92	44 55 34.5	74 47 56.3
Road crossing 1,090 feet east of milepost 90	44 55 38.5	74 45 49.4
Helena station, New York & Ottawa Ry. crossing	44 55 26.9	74 43 02.1
Road crossing 2,045 feet west of milepost 85	44 55 35.7	74 40 32.1
Road crossing 1,670 feet west of milepost 83	44 55 43.9	74 38 01.1
Road crossing 245 feet west of milepost 82	44 55 50.6	74 36 28.5
Bombay station, northwest corner of	44 56 19.0	74 34 19.6
Bombay, church steeple	44 56 22.5	74 33 56.8

Along New York Central & Hudson River Railroad from Helena to Moira.

Ironton flag station, road crossing 380 feet north of	44 53 55.6	74 41 07.5
Road crossing 4,125 feet north of milepost 62	44 53 13.9	74 39 44.0
Road crossing 370 feet north of milepost 57	44 51 12.4	74 36 15.4
Road crossing one-half mile south of milepost 56	44 50 14.5	74 34 57.3

Along highways near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Private T road east to large house	44 48 19.6	74 30 01.8	.....
Brushton, 1 mile south of, T road east (magnetic declination, 12° 06′ W.)	44 48 52.4	74 30 05.8	3,329
Brushton station, 245 feet east of	44 49 48.6	74 30 33.0	6,012
Brushton, 0.60 mile north of, three corners (magnetic declination 13° 55′ W.)	44 50 15.7	74 30 54.0	3,132
Brushton, about 3.50 miles north of, in northeast corner of abutment of bridge over Little Salmon River; tablet stamped "Prim. Trav. Sta. No. 3, 1914"	44 52 22.3	74 30 21.3	.....
Brushton, about 5 miles north of, four corners, 40 feet southwest to corner of barn (magnetic declination 11° 38′ W.)	44 53 41.9	74 30 51.2	8,341
Brushton, about 5.60 miles north of, on town line, 160 feet northwest to yellow house, T road north (magnetic declination 11° 32′ W.)	44 53 47.8	74 30 07.0	3,240
Brushton, about 6.20 miles north of, T road east, 400 feet northeast to house	44 54 18.3	74 30 11.1	3,098
Brushton, about 6.80 miles north of, three corners, road northwest, 40 feet through gate (magnetic declination 11° 32′ W.)	44 54 48.1	74 30 15.0	3,030
Fort Covington, about 4 miles south of, north and south road at fork southwest, 240 feet northwest to house	44 56 07.2	74 30 25.9	8,043
Fort Covington, about 3.40 miles south of, four corners, 100 feet southwest to red schoolhouse	44 56 42.7	74 30 31.6	3,611

Along highways near south border of quadrangle.

T road south, 50 feet southeast to house, 100 feet southwest to house	44 46 23.1	74 30 46.2	.....
Red schoolhouse, 150 feet southwest of, T road north	44 45 48.4	74 32 00.4	6,410
T road south to Dickinson Center, 30 feet southwest to signpost	44 45 12.2	74 33 16.8	6,630
Drill hole in stone 10 by 10 feet and 2.50 feet above ground; 15 feet east to a +, 120 feet northwest to log house, 50 feet southeast to bars, at north and south road	44 45 17.7	74 36 15.2	.....
T road west, 150 feet southwest to red schoolhouse	44 46 12.9	74 36 23.8	5,617
Four corners, 40 feet southeast to two mail boxes	44 46 08.7	74 37 45.2	5,895
Lawrenceville, 0.50 mile southeast of, T road north	44 46 04.4	74 38 34.7	3,600
Lawrenceville, west part of, 70 feet southwest to brick house, three corners	44 46 20.4	74 39 18.8	3,565
Lawrenceville, 0.80 mile southwest of, 30 feet northeast to signpost, crossroads	44 46 10.5	74 40 18.3	4,410
Lawrenceville, 1.60 miles southwest of, 30 feet south to bridge, 30 feet west to bridge, crossroads	44 45 59.5	74 41 23.7	4,850
Lawrenceville, 2.80 miles southwest of, 80 feet northwest to cheese factory, 80 feet southwest to yellow house, four corners	44 45 43.2	74 42 50.9	6,510
Lawrenceville, 2.10 miles southwest of, 40 feet northeast to yellow schoolhouse, T road south	44 46 19.4	74 42 59.0	3,700
Lawrenceville, 1.30 miles southwest of, 20 feet northeast to mail box, 40 feet southeast to two mail boxes; four corners	44 47 00.6	74 43 02.2	4,176
Lawrenceville, 0.30 mile southwest of, 1,120 feet east of milepost No. 83 (formerly milepost No. 79), road crossing (tie to McNair's traverse line 1900), McNair's position accepted	44 47 58.2	74 43 09.8	5,847

Magnetic declination near south border of quadrangle, 12° 36′ W.; near west border, 13° 08′ W.

NICHOLVILLE QUADRANGLE.

Along highways near north border of quadrangle.

Stations.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Dickinson Center, 40 feet northwest to store, four corners	44 44 55.0	74 33 51.5	.....
Dickinson Center, 1.60 miles southwest of, 20 feet southwest to sign, 20 feet northwest to sign, four corners	44 44 12.2	74 35 31.4	8,419

Magnetic declination near north border of quadrangle, 12° 36′ W.

SANTA CLARA QUADRANGLE.

On highways near north border of quadrangle.

Stations.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T road north, 30 feet northeast to three mail boxes (magnetic declination, 23° 24′ W.)	44 44 45.4	74 15 20.8	.....
Lake Titus, at north end of, 40 feet east to store; three corners (magnetic declination, 10° 18′ W.)	44 44 31.6	74 17 19.0	.....

PENNSYLVANIA.

TRIANGULATION STATIONS.

Carnegie quadrangle.

ALLEGHENY COUNTY.

For the purpose of testing the accuracy of distances between triangulation stations in southwestern Pennsylvania established by the United States Geological Survey in 1899 and 1900 (see Bulletin 181), a check base was measured in the spring of 1914 near Carnegie and expanded to stations Hickman, McDonald, and Union Church. All of the observations were made independently by two observers, S. S. Gannett and G. T. Hawkins. The base, 7,000 feet in length, was measured twice along a tangent of the Wabash Railroad southeast of Carnegie using United States Geological Survey invar tape 3 T. The two measurements uncorrected for temperature differed by 0.02 foot, and allowing for difference of temperature the discrepancy was 0.001 foot. Angles at all stations were measured at least 10 times by Mr. Hawkins, using 8-inch theodolite No. 424, reading by micrometers to 2 seconds of arc, and were also measured independently 10 times or more by Mr. Gannett, using 8-inch micrometer theodolite No. 435. In making a final computation all these angles were combined and a least-square figure adjustment made, 7 stations in the scheme forming two figures.

The tape as compared at the Bureau of Standards, Washington, D. C., April 20, 1914, was found to be 299.98 feet in length. After the work was completed it was tested again on May 20, 1914, by the Bureau of Standards and found to be 299.9796 feet in length—that is, practically no change had been made in the length of the tape by use in measurement.

Each end of the base is in a deep cut and in order to expand to the triangulation stations it was necessary to transfer the north end to the embankment 65 feet west of the track and to transfer the south end to the embankment 32 feet east of the track. An iron post 3½ inches in diameter and 4 feet in length was set as a permanent mark on the bank at each end as thus transferred and a tripod signal erected exactly over center of each post.

The distance measured along the track was then computed, using value of tape 299.98 feet as follows:

	Feet.
23⅓ tapes × 299.98 feet	6,999.530
Reduction to horizontal	−.120
Reduction to sea level	−.300
Correction for temperature, reduction to 62° F.	+.053
Length of base on track reduced to sea level	6,999.163

The distance from signal to signal was then computed allowing for the offset at each end of base, the result obtained being 6,999.824 feet, log. meters = 3.3291030.

Using the latter value in log. meters, distances were computed from the base through 10 triangles to lines of the old triangulation Hickman-McDonald, Hickman-Union United Presbyterian Church and McDonald-Union United Presbyterian Church, the new values for these distances being shorter than the old ones by one part in 16,000, or less than 4 inches in a mile, thus proving the error in the old work smaller than one would expect in triangulation extended for topographic control and not for geodetic purposes.

In 1900 a check on distance derived from the Hillside base was made on the line St. Clair-Morley, near the Pennsylvania-West Virginia State line; the value from Hillside base being long by 1 foot in 9,222. In 1901 another check on distance was made in the line Palmer-McCoy in Indiana County, the value from Hillside base being long by 1 foot in 9,600. In Allegheny County the distances which have been used are therefore much nearer correct than those between stations further removed from the Hillside base.

CARNEGIE NORTH BASE, ALLEGHENY COUNTY, PA.

Situated 0.1 mile north of Wabash-Pittsburgh Terminal Station at Carnegie, on bank of cut west of railroad, 65.5 feet west of west rail.

Signal: A lumber tripod over center.

Station mark: An iron bench-mark post set 3½ feet in ground.

Reference marks: 14.15 feet west to curb inside line on east side of paved street; southeast corner of two-story house 139.8 feet true azimuth 178° 59′; south end of straight curb line 137 feet on west side of paved street, true azimuth 38° 26′.

[Latitude 40° 24′ 21.58″. Longitude 80° 04′ 39.48″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Feet.*
Carnegie South Base	21 20 35.37	201 20 14.03	3.3291030	6,999.82
Hickman	41 54 42.46	221 52 03.48	3.9380110	28,444.30
Ewing	96 17 25.65	276 15 48.83	3.5493665	11,623.87

CARNEGIE SOUTH BASE, ALLEGHENY COUNTY, PA.

Situated 1.3 miles south of Carnegie railroad station, Wabash-Pittsburgh Terminal, 31 feet east of track, 5 feet east of edge of steep bank of railroad cut and about 100 feet south of the south end of tangent.

Signal: A tripod over center.

Station mark: An iron bench-mark post set in ground; top projects 6 inches above surface.

Reference marks: Center of oil well, 121.5 feet distant, true azimuth 8° 46′; nail in blaze in maple tree, 102.5 feet distant, azimuth 250° 43′.

[Latitude 40° 23′ 17.15″. Longitude 80° 05′ 12.40″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Feet.*
Hickman	48 18 56.53	228 16 38.91	3.8269992	22,028 42
Ewing	130 51 52.40	310 50 36.94	3.5599303	11,910.07
Carnegie North Base	201 20 14.03	21 20 35.37	3.3291030	6,999.82

EWING, ALLEGHENY COUNTY, PA.

A station in the base expansion, on a cleared ridge 2 miles west of Carnegie, on land owned by Mr. Ewing, 400 yards southwest of his house, occupied by a renter.

Signal: A lumber tripod over center.

Station mark: An iron bench-mark post set 3 feet in ground.

Reference marks: (1) Nail in dead cedar tree on southwest side of hill, 45.0 feet distant, true azimuth 41° 13′; (2) nail in cherry tree on northeast side of hill, 163.3 feet distant, true azimuth 199° 59′.

[Latitude 40° 24′ 34.14″. Longitude 80° 07′ 08.84″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Feet.*
Hickman	18 19 48.79	198 18 46.57	3.8577430	23,644.34
Oakdale	56 51 33.76	236 49 30.47	3.7291087	17,583.00
Union United Presbyterian Church	145 28 25.97	325 27 14.09	3.6636188	15,121.78
Carnegie North Base	276 15 48.83	96 17 25.65	3.5493665	11,623.87
Carnegie South Base	310 50 36.94	130 51 52.40	3.5599303	11,910.07

OAKDALE, ALLEGHENY COUNTY, PA.

In a cultivated field on a cleared ridge 1.5 miles south of Oakdale, and 0.25 mile southeast of house of Mr. Watters. The land is owned by the Boys' Industrial Home.

Signal: A quadripod of sawed lumber over center of mark.

Station mark: An iron bench-mark post set 3.2 feet in ground.

Reference mark: Nail in tree 63.9 feet distant, true azimuth 217° 37′. Wire fence is 7.2 feet northwest.

[Latitude 40° 22′ 59.11″. Longitude 80° 10′ 19.08″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Feet.*
McDonald	62 59 10.54	242 57 01.99	3.7206852	17,245.25
Union United Presbyterian Church	195 32 27.66	15 33 19.14	3.8440840	22,912.26
Ewing	236 49 30.47	56 51 33.76	3.7291087	17,583.00
Hickman	330 22 30.99	150 23 32.00	3.6530044	14,756.67

HICKMAN, ALLEGHENY COUNTY, PA.

On a bald hill in South Fayette Township, 2½ miles southwest of Bridgeville, on land belonging to William Hickman, who lives on south side of hill.

Station mark: A sandstone post 30 by 12 by 12 inches, set 28 inches in the ground, in the center of top of which is cemented a bronze tablet marked "U. S. Geological Survey—Pennsylvania."

[Latitude 40° 20′ 52.33″. Longitude 80° 08′ 44.87″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Feet.*
Oakdale	150 23 32.00	330 22 30.99	3.6530044	14,756.67
Ewing	198 18 46.57	18 19 48.79	3.8577430	23,644.33
Carnegie North Base	221 52 03.48	41 54 42.46	3.9380110	28,444.30
Carnegie South Base	228 16 38.91	48 18 56.53	3.8269992	22,028.42
Canonsburg [a]	14 35 39.2	194 34 17.5	4.0737263	
McDonald [a]	102 26 54.8	282 23 45.3	3.8495728	23,203.69
			[b]3.8495456	23,202.24
Union United Presbyterian Church [a]	178 07 14.0	358 07 04.4	4.0271348	34,923.60
			[b]4.0271076	34,921.41
Shannon [a]	262 57 02.4	85 01 46.0	4.0175377	

[a] From Hillside base. [b] From Carnegie base.

McDONALD, WASHINGTON COUNTY, PA.

In a field at the highest part of a hill half a mile south of McDonald, on land owned by Mr. William F. Wood, who lives on the southeast side of hill.

Station mark: A sandstone post 31 by 7 by 7 inches, set 55 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet marked "U. S. Geological Survey—Pennsylvania."

Reference marks: A large black-oak line tree at the north boundary fence, 275 feet distant. A large white-oak line tree at the west boundary fence, 303 feet distant.

[Latitude 40° 21′ 41.66″. Longitude 80° 13′ 37.56″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Feet.*
Oakdale	242 57 01.99	62 59 10.54	3.7206852	17,245.25
Union United Presbyterian Church	215 40 45.6	35 43 45.7	4.0503035	36,837.31
			[b]4.0502763	36,835.00
Hickman	282 23 45.3	102 26 54.8	3.8495728	23,203.69
			[b]3.8495456	23,202.24
Garrett[a]	27 46 53.9	207 43 09.8	4.2450948	
Dickson[a]	162 21 09.3	342 18 57.4	4.1985263	
Shannon[a]	270 46 02.6	90 53 55.8	4.2365717	
Canonsburg[a]	343 09 24.7	161 11 12.3	4.1326119	

[a] From Hillside base. [b] From Carnegie base.

UNION UNITED PRESBYTERIAN CHURCH, ALLEGHENY COUNTY, PA.

A brick church with a square tower on its northeast corner, situated on a hill 1 mile west of Remington, on the Steubenville pike.

Station mark: Center of tower.

[Latitude 40° 26′ 37.25″. Longitude 80° 08′ 59.69″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Feet.*
Oakdale	15 33 19.14	195 32 27.66	3.8440840	22,912.26
Ewing	325 27 14.09	145 28 25.97	3.6636188	15,121.78
McDonald[a]	35 43 45.7	215 40 45.6	4.0503035	36,837.31
			[b]4.0502763	36,835.00
Hickman[a]	358 07 04.4	178 07 14.0	4.0271348	34,923.60
			[b]4.0271076	34,921.41
Dickson[a]	117 40 04.8	297 34 52.5	4.1070426	
Weir[a]	173 11 33.3	353 10 40.1	4.2101067	
Greentree[a]	243 05 13.9	63 10 18.2	4.0926886	
Calhoun[a]	294 06 16.4	114 14 59.9	4.3196701	
Shannon[a]	311 13 32.8	131 18 26.2	4.1524041	

[a] From Hillside base. [b] From Carnegie base.

OREGON.

TRIANGULATION STATIONS.

Condon, Heppner, Twickenham, Spray, Round Mountain, Paulina, and Crook quadrangles.

GILLIAM, WHEELER, CROOK, MORROW, AND GRANT COUNTIES.

The following geodetic positions on approximate North American datum were determined by triangulation in 1913 by J. R. Ellis, topographer. Starting from the base Ione, Toby, John Day, described in Bulletin 551, the scheme was carried southward and connected with stations Snow and Field of Baker City base, described in appendix to Twentieth Annual Report.

BALDY, WHEELER COUNTY, OREG.

Situated on the highest point of a bluff on the west side of a flat-top mountain locally known as Bald Mountain or Baldy. It is about 12 miles northeast of Mitchell and 4 miles west of Waterman.

Station mark: An aluminum tablet set in solid rock.

Signal: A cairn 5 feet base by 5.5 feet in height centered over tablet.

[Latitude 44° 39′ 32.31″; longitude 119° 58′ 42.67″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Pisgah	42 24 30.09	222 13 42.63	4.4807326	18.797
Black Butte	64 44 36.0	244 32 11.3	4.41292	16.080
Wagner	114 02 22.01	293 43 33.68	4.5864176	23.977
Craggy	142 07 03.0	321 58 04.0	4.43610	16.961
Rancheria	154 55 45.04	334 49 04.48	4.4690274	18.296
Juniper	304 26 46.97	124 34 19.11	4.2361631	10.703
Spanish	329 41 02.60	149 49 39.08	4.5089666	20.059

BLACK BUTTE, WHEELER COUNTY, OREG. (Not occupied.)

Highest point of a dark-colored butte located about 6 miles west of Mitchell and locally known as Black Butte.

[Latitude 44° 33′ 33.3″; longitude 120° 16′ 23.1″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ″	° ″	*Log. meters.*	*Miles.*
Wagner	155 56 04	335 49 42	4.46625	18.180
Rancheria	195 57 06	16 02 52	4.59398	24.396
Baldy	244 32 11	64 44 36	4.41292	16.080

BUCKHORN, GILLIAM COUNTY, OREG. (Not occupied).

An intersected point situated on a round-topped hill 0.5 mile north of the Gilliam-Wheeler County line and about 2 miles east of John Day River. Station is on the Buckhorn Ranch and about 3 miles southwest of ranch house. Elevation, 3,165 feet.

Signal: A tripod of 2 by 4 inch plank, boarded on three sides and covered with white cloth. Signal is centered over station mark.

Station mark: A stone with cross cut in top, projecting 4 inches above surface of ground.

[Latitude 45° 04′ 35.90″; longitude 120° 27′ 04.72″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Linville	213 52 44.4	33 59 18.7	4.33758	13.518
Squaw	279 41 41.0	99 58 20.1	4.49624	19.480
Clarno	329 59 05.7	150 02 24.2	4.08951	7.636

CLARNO, WHEELER COUNTY, OREG.

Situated on highest point of ridge 9 miles west of Fossil and 5 miles east of John Day River. It is located in center of small natural mound and about 200 feet north of lone juniper bush. Station can be reached by following Fossil-Mitchell wagon road south about 0.5 mile south of Fossil, then turning west on road up grade; at top of divide signal can be seen about 3 miles to the west.

Signal: A tripod of 2 by 4 inch plank, boarded on three sides, and covered with white cloth. Signal is centered over station mark.

Station mark: Iron bench mark post centered over a bottle set 38 inches below surface of ground; post projects 10 inches above surface.

[Latitude 44° 58′ 51.07″; longitude 120° 22′ 14.16″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Wagner	11 13 04.52	191 10 56.22	4.3125803	12.762
Buckhorn	150 02 24.2	329 59 05.7	4.08951	7.636
Linville	191 49 36.86	11 52 52.04	4.4671498	18.218
Rock Creek	225 08 14.87	45 25 40.12	4.6567299	28.189
Squaw	257 50 03.50	78 03 23.32	4.4036166	15.739
Fossil	278 24 06.32	98 32 19.01	4.1887935	9.597
Rancheria	295 53 31.26	116 03 33.66	4.3180539	12.924

CRAGGY, WHEELER COUNTY, OREG. (Not occupied.)

Highest point of a rock crag situated on the east side of the Fossil-Mitchell stage road and about 12 miles north of Twickenham post office. It is known locally as Craggy.

Station mark: Center of highest point.

[Latitude 44° 51′ 09.51″; longitude 120° 11′ 25.99″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Wagner	72 21 03.7	252 11 11.6	4.28720	12.038
Fossil	184 04 40	4 05 08	4.07930	7.460
Rancheria	219 43 24	39 45 42	3.82491	4.152
Baldy	321 58 04	142 07 03	4.43610	16.960

DEVILS HILL, GILLIAM COUNTY, OREG.

Situated on highest part of short ridge known as Devils Hill. It is in cultivated field owned by Shelby Burris, 10 miles north by 10 miles west of Condon. It is about 0.25 mile east of quarter corner between secs. 23 and 24, T. 2 S., R. 19 E. The Condon-Moro wagon road passes over south end of hill. Elevation, 2,740 feet.

Signal: A tripod of 2 by 4 inch plank, boarded on the three sides, and covered with white cloth. Signal is centered over station mark.

Station mark: A standard bench-mark post centered over a bottle set 36 inches below the surface of ground; post projects about 12 inches above surface.

Reference marks: A stone with cross cut in top, set at corner of fence at elbow in public highway, bears 254° 13′ 42″ true; distance 1,527.9 feet; a cairn of stone built on a small natural mound bears 359° 33′ 00″ true; distance 1,690.3 feet.

[Latitude 45° 22′ 52.02″; longitude 120° 23′ 35.05″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
John Day	127 27 57.96	307 21 34.26	4.1686539	9.162
Toby	231 09 43.27	51 20 24.57	4.3991881	15.579
Wester Butte	274 35 05.59	94 43 09.61	4.1716197	9.226
Rock Creek	290 18 35.31	110 36 54.59	4.5555116	22.329
Linville	334 25 23.20	154 29 29.45	4.2430360	10.874

FIELDS, GRANT COUNTY, OREG.

On the highest bald summit at the head of Fields Creek; 8 miles southwest of Mount Vernon post office and 6 miles south of John Day River. Follow trail up Fields Creek 8 miles, thence up steep ridge to left, leading to station. Best approached from the southwest side, as the ridges on the north side are very steep and rocky.

Station mark: Copper bolt cemented in solid rock, above it a rock cairn 5 feet in height.

[Approximate North American datum: Latitude 44° 20′ 20.95″; longitude 119° 15′ 26.27″. Baker City astronomic: Latitude 44° 20′ 20.60″; longitude 119° 15′ 35.18″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Snow [a]	25 01 39.82	204 51 43.44	4.6542661	.....
Snow [b]	25 01 34.28	204 51 37.89	4.6542932	.....
Long [b]	204 59 59.38	25 08 58.54	4.6030953	.....
Greenhorn [b]	232 46 42.57	53 16 01.50	4.8409415	.....
Dixie [b]	241 24 35.94	61 51 09.39	4.7570659	.....
Strawberry [b]	273 43 31.37	94 06 15.10	4.6360569	.....
Soda [b]	318 13 49.6	138 26 36.9	4.5651789	.....
Baldy [b]	322 34 36.70	142 52 42.36	4.7576209	.....
Silvies [b]	336 10 56.3	156 20 14.4	4.6456061	.....

[a] North American datum. [b] Baker City astronomic.

FOSSIL, WHEELER COUNTY, OREG.

Situated on Ball Mountain on the highest point of a rocky ledge, 1 mile south and 2 miles east of Fossil village.

Signal: A rock cairn 5 feet base by 5 feet in height centered over tablet.

Station mark: An aluminum tablet cemented in solid rock.

[Latitude 44° 57′ 37.37″; longitude 120° 10′ 47.04″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Craggy	4 05 08.0	184 04 40.0	4.07930	7.458
Wagner	47 16 16.73	227 05 51.07	4.4199205	16.342
Clarno	98 32 19.01	278 24 06.32	4.1887935	9.597
Squaw	231 26 24.62	51 31 31.40	4.0844841	7.548
Rancheria	333 26 33.13	153 28 23.09	3.8831071	4.747

HEADLAND, CROOK COUNTY, OREG. (Not occupied.)

Highest point of a high bluff facing the south, 4 miles northeast of Barnes post office.

[Latitude 43° 59′ 11.9″; longitude 120° 13′ 38.7″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Spanish	217 35 34	37 54 32	4.77242	36.792
Fields	242 53 00	63 33 32	4.93902	53.997
Suplee	251 56 56	72 22 21	4.70988	31.859

JUNIPER BUTTE, WHEELER COUNTY, OREG.

Situated on the highest point of hill locally known as Juniper Butte, and about 6 miles southeast of Waterman.

Signal: A rock cairn 5 feet base by 6 feet in height centered over tablet.

Station mark: An aluminum tablet set in solid rock.

[Latitude 44° 34′ 16.16″; longitude 110° 47′ 58.91″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Pisgah	70 07 47.45	249 49 29.16	4.5661538	22.882
Baldy	124 34 19.11	304 26 46.97	4.2361631	10.703
Spanish	353 32 47.86	173 33 52.81	4.2611436	11.337

LINVILLE, GILLIAM COUNTY, OREG.

Situated on ridge 6.5 miles west of Condon, in field owned by T. J. Linville, and about 700 feet northeast of Linville schoolhouse.

Signal: A tripod of 2 by 4 inch plank, boarded on three sides and covered with white cloth.

Station mark: A standard iron bench-mark post centered over a bottle set 36 inches below surface of ground.

[Latitude 45° 14′ 20.56″; longitude 120° 17′ 48.66″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Clarno	11 52 52.04	191 49 36.86	4.4671498	18.218
Buckhorn	33 59 18.7	213 52 44.4	4.33758	13.518
Devils Hill	154 29 29.45	334 25 23.20	4.2430360	10.874
Wester Butte	206 27 33.52	26 31 30.72	4.2120989	10.126
Rock Creek (observed)	262 50 59.60	83 05 11.52	4.4208512	16.376
Rock Creek (computed from north)	262 50 54.17	83 05 06.09	.....	.....
Squaw	321 17 55.39	141 28 01.75	4.4764520	18.612

MAUPIN BUTTE, CROOK COUNTY, OREG.

Situated on east point of Maupin Butte, a flat-top hill about 4 miles south of Paulina village. Hill is covered with juniper trees and is on Government land, and can be easily reached by horseback on the north and west sides.

Signal: A rock cairn 5 feet base by 6 feet in height covered with white cloth and centered over tablet.

Station mark: An aluminum tablet cemented in solid rock.

[Latitude 44° 04′ 04.47″; longitude 119° 56′ 20.43″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Pisgah	151 29 32.95	331 17 09.61	4.6931505	30.655
Spanish	199 10 39.33	19 17 33.87	4.6023220	24.870
Fields	240 48 42.36	61 17 13.15	4.7942331	38.690
Suplee	255 18 41.40	75 32 04.72	4.4237651	16.486
Snow	286 40 22.46	106 58 52.67	4.5702606	23.100

PISGAH, WHEELER COUNTY, OREG.

Situated on highest part of high ridge, known locally as Pisgah Mountain, about 8 miles southwest of Mitchell, 5 miles north of Big Summit Prairie, and 7 miles northeast of Round Mountain.

A wagon road (sawmill road), southwest from Mitchell, passes over the ridge 1¼ miles west of the station.

Signal: A rock cairn, 5 feet base by 6 feet in height, surmounted by a small pine tree and located 5 feet northwest of station mark.

Station mark: An aluminum tablet cemented in solid rock.

[Latitude 44° 27′ 27.66″; longitude 120° 14′ 05.46″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Wagner	158 31 08.81	338 23 10.75	4.6111267	25.380
Rancheria	189 00 15.48	9 04 24.47	4.6958656	30.848
Baldy	222 13 42.63	42 24 30.09	4.4807326	18.797
Juniper	249 49 29.16	70 07 47.45	4.5661538	22.882
Spanish	278 23 37.73	98 42 59.31	4.5695024	23.060
Suplee	306 27 06.77	126 52 56.66	4.7877728	38.117
Maupin Butte	331 17 09.61	151 29 32.95	4.6931505	30.655

RANCHERIA, WHEELER COUNTY, OREG.

Situated on highest part of high rocky butte, locally known as Rancheria. This butte is about 9 miles southeast of Fossil, on the divide between Butte and Rowe creeks. The Fossil-Rowe Creek wagon road passes within 0.5 mile of the station.

Signal: A rock cairn, 4.5 feet base by 5 feet in height, centered over tablet.

Station mark: An aluminum tablet cemented in solid rock.

[Latitude 44° 53′ 55.96″; longitude 120° 08′ 11.35″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Pisgah	9 04 24.47	189 00 15.48	4.6958656	30.848
Black Butte	16 02 51.60	195 57 05.52	4.59398	24.396
Craggy	39 45 41.65	219 43 24.33	3.82491	4.152
Wagner	64 11 23.72	243 59 14.07	4.4024218	15.695
Clarno	116 03 33.66	295 53 31.26	4.3180539	12.923
Fossil	153 28 23.09	333 26 33.13	3.8831071	4.747
Squaw	202 55 20.18	22 58 36.78	4.1941686	9.717
Baldy	334 49 04.48	154 55 45.04	4.4690274	18.296

POLITECHNIKA GDAŃSKA ZAKŁAD GEOLOGII

ROCK CREEK, MORROW COUNTY, OREG.

Situated on highest part of round hill on property of James Murtha, 10.5 miles east by 1.5 miles north of Condon. It is about 0.25 mile south of corner of secs. 28, 29, 32, and 33, T. 3 S., R. 23 E.

Signal: A tripod of 2 by 4 inch plank boarded on three sides and covered with white cloth. Signal is centered over station mark.

Station mark: A standard iron bench-mark post centered over a bottle set 38 inches below surface of ground.

[Latitude 45° 16′ 05.09″; longitude 119° 57′ 49.16″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Squaw	15 47 31.02	195 43 27.16	4.4420126	17.193
Clarno	45 25 40.12	225 08 14.87	4.6567299	28.189
Linville (observed)	83 05 11.52	262 50 59.60	4.4208512	16.376
Linville (computed from north)	83 05 06.09	262 50 54.17	.....	.....
Devils Hill	110 36 54.59	290 18 35.31	4.5555116	22.329
Westers Butte	121 08 47.16	300 58 31.53	4.3427110	13.679
Ione	207 58 00.58	28 04 32.51	4.4067223	15.849

SECONDARY POINTS.

[Approximate North American datum.]

Station.	Latitude.	Longitude.
	° ′ ″	° ′ ″
T. 2 S., R. 21 E., corner of secs. 20, 21, 28, and 29	45 22 26.10	120 12 30.92
T. 2 S., R. 19 E., corner of secs. 23, 24, 25, and 26	45 22 29.85	120 23 55.86
T. 3 S., R. 23 E., corner of secs. 28, 29, 32, and 33	45 16 19.65	119 57 46.84
T. 4 S., R. 20 E., quarter corner between secs. 10 and 11	45 14 09.62	120 17 54.90
T. 6 S., R. 22 E., center of sec. 23	45 01 45.72	120 03 26.72

SNOW, GRANT COUNTY, OREG.

Snow Mountain is in Grant County very near the Harney County line. Station is on the highest point of bald ridge and is well known locally as Snow Mountain, as there is generally a small bank of snow on north side. It is at the source of Emigrant Creek, South Fork of John Day River, Silver Creek, and the waters of Crooked River. It is the highest point for a long distance south of the Strawberry Range. Can be easily ascended from almost any direction on horseback.

Station mark: A bronze triangulation tablet cemented in solid rock under a cairn 7 feet in diameter at base and 9 feet high.

[Approximate North American datum: Latitude 43° 58′ 15.79″; longitude 119° 29′ 42.79″. Baker City astronomic: Latitude 43° 58′ 15.34″; longitude, 119° 29′ 51.30″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Fields [a]	204 51 43.44	25 01 39.82	4.6542661	.....
Fields [b]	204 51 37.89	25 01 34.28	4.6542932	.....
Strawberry [b]	238 25 45.71	58 58 21.19	4 8635558	.....
Baldy [b]	274 41 18.41	95 09 14.64	4.7328401	.....
Trout [b]	289 10 17.11	109 36 22.18	4.7276892	.....
Burns [b]	326 15 04.53	146 30 13.06	4.7246653	.....

[a] North American datum. [b] Baker City astronomic.



SPANISH PEAK, WHEELER COUNTY, OREG.

Situated on the highest point of a bald mountain locally known as Spanish Peak or Bald Mountain. Station is about 3.5 miles south and 2 miles east of Antone store and post office. The north end of the mountain breaks off abruptly; the south end is sloping. Station is located at north end. To reach station from Antone follow up Rock Creek to sawmill, about 2 miles, thence east by road and trail to gap, thence south by trail.

Signal: A cairn 5 feet base by 6 feet in height centered over tablet.

Station mark: An aluminum tablet set in top of stone 10 by 8 by 26 inches which projects 8 inches above surface of ground.

[Latitude 44° 24′ 28.81″; longitude 119° 46′ 26.23″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Maupin Butte	19 17 33.87	199 10 39.33	4.6023220	24.870
Headland	37 54 33	217 35 35	4.77242	36.792
Pisgah	98 42 59.31	278 23 37.73	4.5695024	23.060
Baldy	149 49 39.08	329 41 02.60	4.5089666	20.060
Juniper	173 33 52.81	353 32 47.86	4.2611436	11.337
Fields	280 20 45.83	100 42 26.28	4.6219570	26.020
Snow	335 14 50.06	155 26 29.50	4.7277199	33.196
Suplee	338 10 33.69	158 17 04.72	4.5250645	20.817

SQUAW, WHEELER COUNTY, OREG.

Situated on highest point of high sharp butte locally known as Squaw Butte. It is near center of sec. 23, T. 6 S., R. 22 E., and 8 miles east by 2 miles north of Fossil. The foot of the butte can be reached by wagon road from both Fossil and Mayville.

Signal: Rock cairn 5 feet high located on highest point of Butte. Elevation, 4,579 feet.

Station mark: An aluminum tablet cemented in stone ledge 5.3 feet south of rock cairn.

[Latitude 45° 01′ 42.43″; longitude 120° 03′ 33.14″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Rancheria	22 58 36.78	202 55 20.18	4.1941686	9.717
Fossil	51 31 31.40	231 26 24.61	4.0844841	7.548
Clarno	78 03 23.32	257 50 03.50	4.4036166	15.739
Buckhorn	99 58 20.12	279 41 41.04	4.49624	19.480
Linville	141 28 01.75	321 17 55.39	4.4764520	18.612
Rock Creek	195 43 27.16	15 47 31.02	4.4420126	17.193

SUPLEE, GRANT COUNTY, OREG.

Situated on highest point of wooded hill about 4 miles north and 4 miles east of Suplee post office and 1½ miles east and ½ mile north of Bernard's ranch house. To reach station go north from Suplee post office on private road to Bernard's house, thence northeast on private road to divide, thence southeast through wood to station.

Lines to five stations were cut through timber.

Signal: A rock cairn 5 feet base by 7 feet in height covered with white cloth and centered over tablet.

Station mark: An aluminum tablet cemented in solid rock 8 inches below surface of ground, over which a flat circular stone is laid.

[Latitude 44° 07′ 40.82″; longitude 119° 37′ 06.03″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Headland	72 22 21	251 56 56	4.70988	31.858
Maupin Butte	75 32 04.72	255 18 41.40	4.4237651	16.486
Pisgah	126 52 56.66	306 27 06.77	4.7877728	38.117
Spanish	158 17 04.72	338 10 33.69	4.5250645	20.817
Fields	230 44 29.83	50 59 36.26	4.5702524	23.100
Snow	330 27 19.16	150 32 27.34	4.3018427	12.450

WAGNER, JEFFERSON COUNTY, OREG.

Situated on highest point of Wagner Butte, a double-topped butte on the west side of the John Day River and about 1.5 miles west of Wagner's ranch house. The Butte is on the divide betweed the John Day River and Currant Creek. To reach the station from Fossil take the Fossil-Clarno wagon road via Pine Creek. On reaching Pine Creek continue down same about 1.5 miles, leave public road and follow private road southwest over divide, thence down road canyon to John Day River. From this point a trail leads up the river to Wagner's ranch. This route can only be used when the river is low, as it must be forded several times.

Signal: A rock cairn 5 feet base by 6 feet in height centered over tablet and covered with white cloth.

Station mark: An aluminum tablet cemented in solid rock.

[Latitude 44° 47′ 58.38″; longitude 120° 25′ 25.96″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Clarno	191 10 56.22	11 13 04.52	4.3125803	12.762
Fossil	227 05 56.55	47 16 16.73	4.4199205	16.341
Rancheria	243 59 14.07	64 11 23.72	4.4024218	15.695
Craggy	252 11 11.57	72 21 03.69	4.28720-	12.038
Baldy	293 43 33.68	114 02 22.01	4.5864176	23.977
Pisgah	338 23 10.75	158 31 08.81	4.6111267	25.380
Black Butte	335 49 41.20	155 56 02.89	4.46624	18.180

WESTER BUTTE, GILLIAM COUNTY, OREG.

Situated on highest point of sharp hill locally known as Wester Butte. It is 3 miles west by 1.5 miles north of Gwendolen station on land owned by Mr. Wester and is about 0.3 mile southeast of corner of secs. 20, 21, 28, and 29, T. 2 S., R. 21 E. Station can be reached by following main road north from Gwendolen 1 mile, thence turning west through gate and thence west along private road to station. Elevation, 2,729 feet.

Signal: A tripod of 2 by 4 inch plank, boarded on three sides and covered with black cloth. Signal is centered over station mark.

Station mark: Standard iron bench-mark post centered over a bottle set 40 inches below surface of ground; post projects about 8 inches above surface.

[Latitude 45° 22′ 13.02″; longitude 120° 12′ 14.98″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Linville	26 31 30.72	206 27 33.52	4.2120989	10.126
Devils Hill	94 43 09.61	274 35 05.59	4.1716197	9.226
John Day	111 06 08.02	290 51 40.00	4.4530396	17.636
Toby	195 45 45.65	15 48 22.26	4.2445000	10.911
Ione	249 56 20.06	70 13 09.05	4.5153273	20.355
Rock Creek	300 58 31.53	121 08 47.16	4.3427110	13.679

PRIMARY TRAVERSE.

Albany and Salem quadrangles.

MARION AND POLK COUNTIES.

The following geographic positions were determined by primary traverse and are based upon the Coast and Geodetic Survey position for the capitol dome at Salem, and United States Geological Survey primary traverse positions along the north border of the Albany quadrangle described in Bulletins 496 and 551, both on North American datum. The work was done by L. F. Biggs in 1913.

ALBANY QUADRANGLE.

Near northwest corner of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Suver, 1 mile west of; center of T road north	44 44 40.4	123 13 38.0	.....
Prim. Trav. Sta. No. 46, 1911	44 44 36.9	123 12 19.1	5,705

SALEM QUADRANGLE.

Along highways near center of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Orville, 1.6 miles east of, at south edge of road, water trough	44 51 56.8	123 07 31.6	.....
Orville, 1.2 miles east of, center of road at Vitæ Springs	44 51 49.1	123 08 04.1	2,465
Orville, 0.5 mile east of, large bowlder at corner of barn	44 51 13.8	123 08 17.0	3,685
Orville, center of track at road crossing south of	44 51 04.2	123 08 49.2	2,511

Along highways from Independence to Monmouth.

Independence, on sidewalk opposite south wall of Isis Theater, 1.6 feet from edge of curb; chiseled cross	44 51 05.8	123 11 00.9	.....
Independence, spire of Presbyterian Church	44 51 02.0	123 11 17.9	1,289
Independence, 1.1 miles west of, T road north	44 51 06.0	123 12 20.1	4,503
Independence, 1.8 miles west of, railroad crossing	44 50 59.6	123 13 07.7	3,489
Independence, 2.7 miles west of, flagpole on normal school at Monmouth	44 51 05.0	123 14 12.5	4,702

Along highways near west border of quadrangle.

Monmouth, 0.9 mile south of, center of small bridge	44 50 16.8	123 14 03.7	4,928
Monmouth, 1.6 miles south of, T road east	44 49 44.1	123 14 03.8	3,310
Monmouth, 2 miles south of, T road west at cemetery	44 49 22.3	123 14 03.8	2,210
Monmouth, 3 miles south of, west edge of road at T road east, 3 feet north to stone on township line; iron post stamped "Prim. Trav. Sta. No. 4, Oregon 1913"	44 48 13.4	123 14 04.0	6,975
Monmouth, 4.1 miles south of, at end of long tangent, blazed tree inscribed "U. S."	44 47 02.2	123 14 03.8	7,205
Monmouth, 4.9 miles south of, center of T road west; iron stake	44 46 17.5	123 14 04.0	4,528
Monmouth, 5.9 miles south of, 200 feet north of summit of wooded hill, east edge of road; iron post stamped "Prim. Trav. Sta. No. 5, Oregon 1913"	44 45 27.0	123 13 50.3	5,207

Along highways near west side of Willamette River.

Independence, 0.2 mile north of; center of bridge	44 51 14.3	123 11 01.5	.....
Independence, 1.2 miles north of; T road east	44 52 06.8	123 11 06.5	5,328

SALEM QUADRANGLE—Continued.

Along Oregon Electric Railway, near east side of Willamette River.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Halls Ferry station, 1 mile southwest of; bridge over highway	44 52 15.1	123 08 36.9	.....
East Independence station, 15 feet east of, on fence line; iron post stamped "Prim. Trav. Sta. No. 11 Oregon 1913"	44 51 49.7	123 08 43.1	2,606
Orville, center of track at power house	44 51 13.5	123 08 49.2	3,691
Orville, center of track at road crossing	44 51 04.2	123 08 49.2	935
Orville, 0.8 mile south of; center of bridge 50-4	44 50 31.1	123 08 31.4	3,587
Orville, 1.4 miles south of; west edge of right of way, at road crossing under track; iron post stamped "Prim. Trav. Sta. No. 12, Oregon 1913"	44 50 05.5	123 08 07.8	3,102

Along highways near south part of quadrangle.

Buena Vista, opposite old store, east side of road; iron post stamped "Prim. Trav. Sta. No. 28 Oregon 1911"	44 46 07.7	123 08 59.5	.....
Buena Vista, 1 mile north of; mail box at T road east	44 46 58.8	123 09 03.7	5,188
Buena Vista, 1.6 miles north of; three mail boxes at T road	44 47 33.7	123 09 03.3	3,530
Buena Vista, 2 miles north of; fence post under large tree at L in road north	44 47 33.8	123 09 32.4	2,100
Buena Vista, 3.1 miles north of, at T west; signboard reads "Buena Vista 3 miles, Independence 5 miles"	44 48 28.4	123 09 23.4	5,560
Buena Vista, 3.5 miles north of, on east abutment of culvert; chisel mark	44 48 48.9	123 09 28.4	2,111
Independence, 2.9 miles south of; L in road west	44 49 18.8	123 09 23.1	3,045
Independence, 1.4 miles south of, at road east; M. P. Leitch's mail box	44 49 52.9	123 10 59.0	7,729
Independence, 0.25 mile south of, at south edge of town, 500 feet southeast of station, east edge of road; iron post stamped "Prim. Trav. Sta. No. 14 Oregon 1913"	44 50 53.0	123 11 01.0	6,085

Magnetic declination near east border of quadrangle, 22° 09′ E.; near west border of, 22° 17′ E.

Along highways in northwest quarter of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Independence, 2 miles north of; second-class T road east	44 52 47.8	123 11 11.5	.....
Independence, 2.3 miles north of, at road west; signboard reads "Independence 2 miles, Salem 9 miles, Dallas 8 miles"	44 53 01.9	123 11 04.7	1,505
Independence, 3.2 miles north of, at Y road north, east side of road; iron post stamped "Prim. Trav. Sta. No. 7, Oregon 1913"	44 53 45.8	123 10 28.4	5,163
Independence, 4.1 miles north of; telephone pole 4/7 at angle in road	44 54 11.4	123 09 38.8	4,409
Independence, 5 miles north of; T road east	44 54 53.9	123 09 12.2	4,709
Independence, 5.8 miles north of, center of railroad crossing at McNary	44 55 34.8	123 08 48.4	4,480
McNary, 0.2 mile north of; center of bridge	44 55 42.2	123 08 43.8	820
McNary, 0.5 mile north of, north edge of road; iron post stamped "Prim. Trav. Sta. No. 6 Oregon 1913"	44 56 00.5	123 08 48.6	1,882
McNary, 1.4 miles northeast of; T road south	44 55 57.6	123 07 42.4	4,774

Along Oregon Electric Railway in northwest corner of quadrangle.

Halls Ferry station, 0.7 mile northeast of; center of bridge	44 53 32.6	123 07 39.1	.....
Halls Ferry station; center of track opposite	44 53 01.7	123 08 02.7	3,555

Magnetic declination on east border of south half of quadrangle, 22° 20′ E.

SALEM QUADRANGLE—Continued.

Along highways in northeast part of quadrangle.[1]

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Eola store, 150 feet west of; large bowlder 2½ feet high and 2 feet in diameter	44 55 53.5	123 06 55.8	.....
Eola store, 0.4 mile east of, opposite signboard marked "Slow," 300 feet east of water trough; center of track	44 55 55.7	123 06 26.6	2,116
Ferry, 600 feet east of, R. J. Kinney's mail box	44 55 59.5	123 05 44.2	3,076
Salem, 3.4 miles west of, opposite signboard marked "Log Dump"	44 55 51.0	123 05 15.8	2,217
Salem, 3 miles west of, 1,900 feet east of Log Dump station, north edge of road; iron post stamped "Prim. Trav. Sta. No. 8 Oregon 1913"	44 55 46.8	123 04 51.0	1,830
Salem, 2.3 miles west of; railroad signboard marked "Log Dump 1 mile"	44 56 10.8	123 04 09.9	3,833
Salem, 2 miles west of; T road west	44 56 16.2	123 03 49.4	1,567
Salem, 1.7 miles west of, west edge of Kingwood Street at entrance to Kingwood; brick and concrete column	44 56 25.1	123 03 34.4	1,407
Salem, 1 mile west of, at west end of bridge at T road north; hub	44 56 42.8	123 02 52.7	3,490
Salem, 0.4 mile west of; statue on courthouse	44 56 25.5	123 02 07.4	3,696
Salem, dome of State capitol (Coast and Geodetic Survey triangulation station)	44 56 19.47	123 01 43.5	1,826
Salem, near south entrance and in south face of capitol building; aluminum tablet, "elevation 171"	44 56 18.2	123 01 44.0	133

Along Oregon Electric Railway from Salem to Finzer station.

Salem, 0.8 mile southwest of, west edge of South Commercial Street at intersection with Mission Street	44 56 01.4	123 02 35.3	4,060
Salem, 1.2 miles southwest of, east side of track, water tank	44 55 47.9	123 02 56.0	2,019
Salem, 2.2 miles southwest of, at northeast end of tangent center of bridge 52-9	44 55 05.5	123 03 43.1	5,470
Salem, 2.8 miles southwest of, second-class road crossing	44 54 48.6	123 04 13.8	2,790
Salem, 3.6 miles southwest of, center of bridge 54-2	44 54 33.6	123 05 06.9	4,111
Salem, 4.4 miles southwest of, 300 feet east of Livesley, west edge of wagon road at T road to Livesley station; iron post stamped "Prim. Trav. Sta. No. 10 Oregon 1913"	44 54 11.5	123 05 56.4	4,213
Finzer station, 120 feet northeast of; center of bridge	44 53 47.1	123 07 10.0	5,836

Magnetic declination near Salem, 22° 21′ E.

Along highways near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Prim. Trav. Sta. No. 25, 1911	44 43 59.1	123 00 34.5	.....
Jefferson, 3 miles north of, 0.2 mile south of bridge; second-class road west	44 45 39.2	123 01 24.6	10,768
Jefferson, 4.2 miles north of, on Pacific highway at T road west, on west side of road; iron post stamped "Prim. Trav. Sta. No. 1 Oregon 1913"	44 46 39.3	123 01 26.6	6,099
Jefferson, 5.6 miles north of; center of bridge	44 47 47.1	123 02 00.6	7,294
Jefferson, 6.6 miles north of, 725 feet northeast of telephone pole 15/35, opposite abandoned house; center of bridge	44 48 34.3	123 01 37.2	5,073
Jefferson, 7.7 miles north of, near pole 17/11; T road east	44 49 31.1	123 01 47.6	5,813
Jefferson, 8.5 miles north of, summit of Jackson Hill; center of road	44 50 14.5	123 01 47.6	4,398
Jefferson, 9.1 miles north of, at southwest corner of Sunnyside district school No. 96; iron post stamped "Prim. Trav. Sta. No. 2 Oregon 1913"	44 50 43.6	123 01 38.9	3,015
Jefferson, 10.2 miles north of, 1.1 miles north of Sunnyside School; T road south	44 50 49.7	123 03 00.7	5,931
Jefferson, 11.4 miles north of, 2.3 miles north of Sunnyside School, 200 feet northwest of church, east edge of road at T road west; iron post stamped "Prim. Trav. Sta. No. 9 Oregon 1913"	44 51 42.4	123 03 42.4	6,128
T. 8 S., R. 3 W., 1,320 feet east of west center of sec. 20; 1/16 corner	44 51 42.9	123 05 09.2	6,259
T. 8 S., R. 3 W., corner of secs. 17, 18, 19, and 20; stone	44 52 09.1	123 05 27.4	2,964
T. 8 S., R. 3 W., corner of secs. 17, 18, 19, and 20, 1.03 miles west of; T road south	44 52 02.4	123 06 41.9	5,410

[1] For other positions in Salem quadrangle see pp. 517–518.

SALEM QUADRANGLE—Continued.

Along Oregon Electric Railway from Orville to Talbot station.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Orville, 2.3 miles south of; center of bridge 62	44 49 40.6	123 07 15.1	
Orville, 3.2 miles south of; center of bridge 62-8	44 49 28.0	123 06 11.5	4,701
Sidney, 1.1 miles northwest of, signboard "1 mile to Sidney"; center of track	44 49 17.2	123 05 49.0	1,953
Sidney, 375 feet north of station, west edge of right of way, north edge of road, at fence corner; iron post stamped "Prim. Trav. Sta. No. 13 Oregon 1913"	44 48 22.2	123 05 21.0	5,924
Sidney, 2 miles south of; road crossing	44 46 36.7	123 05 28.2	10,690
Sidney, 2.6 miles south of; center of track at milepost 67	44 46 07.8	123 05 30.6	2,930
Talbot, road crossing at	44 45 39.1	123 05 32.9	2,910
Talbot, 0.6 mile southeast of; P. T. Sta. No. 27, 1911	44 45 33.9	123 04 49.2	3,197

Magnetic declination near north border of quadrangle, 22° 46′ E.; near east border 22° 26′ E.; near west border, 22° 28′ E.

Aumsville, Corvallis, Dallas, Lebanon, Sheridan, McCoy, Mount Angel, Tualatin, Salem, and Hillsboro (15′) quadrangles.

CLACKAMAS, LINN, MARION, POLK, WASHINGTON, AND YAMHILL COUNTIES.

The following geographic positions on North American datum were determined by primary traverse and are based upon positions previously located by primary traverse or triangulation stations as herein described, previously published in Bulletins 496 and 551. The work was done in 1913 by L. F. Biggs, in cooperation with the State of Oregon.

AUMSVILLE QUADRANGLE.

Along Southern Pacific Railroad near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Road crossing, 714 C	44 53 37.8	122 59 34.0	
Road crossing	44 52 59.6	122 58 55.9	4,739
State school station, center of track opposite south end station	44 52 33.8	122 58 41.4	2,820
State school, chimney on machine building	44 52 32.6	122 58 22.2	1,382
Road crossing, 712 C–B	44 51 59.7	122 58 17.3	3,353
Turner, 1.4 miles north of, west side of road at fence line, 210 feet north of milepost; iron post stamped "Prim. Trav. No. 29 Ore. 1913. 261 B 1913"	44 51 36.3	122 57 54.7	2,875
Second-class road crossing at end of tangent	44 51 07.4	122 57 25.6	3,600
Turner, center of track opposite semaphore	44 50 34.1	122 57 10.0	3,548
Road crossing, 709 A–B	44 49 26.0	122 56 54.4	6,990
Marion, 4.9 miles north of, west side of railroad at fence line, 110 feet north of milepost 710; iron post stamped "Prim. Travs. No. 30, Ore. 1913, 308 B 1903"	44 49 14.1	122 56 52.1	1,209
Road crossing	44 48 39.8	122 56 43.8	3,532
Second-class road crossing, 708 A B	44 48 18.8	122 56 39.0	2,150
Road crossing, 706 B–C	44 47 19.7	122 56 25.5	6,060
Marion, 1.8 miles north of, west side or railroad at fence line opposite milepost 706; iron post stamped "Prim Trav. No. 31, Ore. 1913, 327 B 1903"	44 46 34.5	122 56 15.6	4,633
Road crossing	44 46 07.3	122 56 10.4	2,778
Marion, road crossing, just north of station	44 45 00.9	122 56 25.9	6,815

From point near Salem east to Geer.

T road north	44 55 42.4	122 59 09.9	
Salem, 2 miles east of; center of cross roads	44 55 42.4	122 58 57.1	920
Salem, 3 miles east of, 100 feet west of slight jog in road, south edge of road; iron post stamped "Prim Trav. No. 32 Ore. 1913"	44 55 42.7	122 57 29.4	6,310
Center of bridge	44 55 42.2	122 56 38.4	3,673
T road south	44 55 38.8	122 55 57.4	2,973
Schoolhouse flagpole	44 55 38.2	122 55 29.3	2,022
T road south	44 55 38.3	122 54 59.6	2,140
T road north	44 55 48.2	122 54 01.1	4,325

Magnetic declination, 22° 30′ E.

AUMSVILLE QUADRANGLE—Continued.

Near northwest corner of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Center Southern Pacific R. R. at road crossing 722 A–B	44 59 07.2	122 59 59.1	

From Turner east to Aumsville.

Turner, center of track, opposite semaphore	44 50 34.1	122 57 10.0	
Large oak tree in center of road at T road south	44 50 21.6	122 56 1[illegible].2	4,355
T road south near bridge	44 50 21.5	122 55 02.5	5,020
Turner, 2.4 miles east of, north edge of road at T road, north, iron post stamped "Prim. Travs. No. 40 Ore. 1913"	44 50 21.3	122 54 21.2	2,977
Center of road at T road north	44 50 28.9	122 52 30.5	8,019
Aumsville, 200 feet north of station, northwest intersection of T road, north; iron post stamped "Prim. Trav. No. 39 Ore. 1913"	44 50 28.6	122 51 55.1	2,552

Magnetic declination, 22° 48′ E.

From point near Shelburn via Stayton to Aumsville.

Center of track at road crossing	44 45 07.2	122 50 45.7	
Culvert, 201	44 45 29.5	122 50 02.8	3,830
Shelburn, 3 miles northeast of, 500 feet northeast of milepost 100, north edge of right of way, east edge of road at road crossing; iron post stamped "Prim. Trav. No. 36, Ore. 1913"	44 45 48.9	122 49 26.0	3,304
Telephone pole inscribed "U. S." at angle in road east	44 46 18.6	122 49 26.6	3,000
Center of T road west, 100 feet north of railroad crossing	44 46 26.3	122 48 13.4	5,335
Angle in road north at second-class road east	44 46 44.8	122 47 36.9	3,232
North Santiam River, center of bridge over south pier	44 47 29.3	122 47 35.8	4,498
Stayton, northwest corner of Water and First streets; iron post stamped "Prim. Trav. No. 37 Ore. 1913"	44 47 47.0	122 47 37.3	1,800
T. 9 S., R. 1 W., center sec. 10, T road west	44 48 11.3	122 47 36.8	2,460
T. 9 S., R. 1 W., quarter corner between secs. 9 and 10, T road east	44 48 11.2	122 48 13.6	2,660
T. 9 S., R. 1 W., corner secs. 3, 4, 9, and 10, T road south	44 48 37.2	122 48 13.3	2,630
T road north	44 48 37.1	122 48 50.1	2,650
T road south	44 48 36.5	122 50 21.5	6,590
T road north, near corner secs. 5, 6, 7, and 8, T. 9 S., R. 1 W.; iron post stamped "Prim. Trav. No. 38 Ore. 1913"	44 48 36.6	122 50 44.3	1,646
Angle in road west	44 49 11.6	122 50 44.0	3,540
Large fence post at angle in road north	44 49 16.5	122 51 38.0	3,924
Railroad crossing, 710 F–G	44 49 22.5	122 51 53.1	1,247
Aumsville, east rail at railroad water tank	44 50 26.8	122 51 52.3	6,505
Aumsville, 200 feet west of station; iron post stamped "Prim. Trav. No. 39 Ore. 1913"	44 50 28.6	122 51 55.1	275

From Aumsville north along Southern Pacific Railroad.

South end of bridge 713 A	44 51 21.6	122 52 07.0	5,443
Road crossing, 714 B–C	44 52 00.6	122 52 03.6	3,951
Shaw, 100 feet southeast of station, east edge of right of way, north edge of road; iron post stamped "Prim. Trav. No. 41, 1913"	44 52 24.8	122 52 08.5	2,473
Road crossing at milepost 716	44 53 16.7	122 52 43.0	5,818
Second-class road crossing, 716 C	44 53 52.3	122 53 06.7	3,978
Macleay, center of track, opposite station window	44 54 22.9	122 53 27.1	3,431
Macleay, 230 feet east of road crossing, in front of town hall; iron post stamped "Prim. Trav. No. 42—Ore. 1913"	44 54 29.4	122 53 25.1	660
"Macleay One Mile" center of track opposite	44 55 11.6	122 53 36.9	4,371
Geer, 600 feet south of station, east side of track at road crossing; iron post stamped "Prim. Trav. No. 33, Ore. 1913"	44 55 47.5	122 53 33.3	3,641
Road crossing	44 56 32.9	122 53 10.7	4,878
Pratum, road crossing, 400 feet south of station	44 57 31.8	122 52 40.8	6,340
Pratum, 0.8 mile north of, east side of track at road crossing; iron post stamped "Prim. Trav. No. 43, Ore. 1913"	44 58 17.0	122 52 17.6	4,868
Switzerland, center of track opposite station	44 58 49.6	122 51 42.8	4,146
Selah, center of track at road crossing	44 59 14.0	122 50 21.1	6,370
Road crossing, 725 A, south edge right of way, east edge of road; iron post stamped "Prim. Trav. No. 53, Ore. 1913"	44 59 34.4	122 49 27.2	4,390
Road crossing	44 59 47.6	122 48 59.9	2,376

Magnetic declination, 22° 30′ E.

Along highway near Pratum.

Center of north and south road at road crossing	44 59 31.2	122 52 46.0	
T road east, rock center road	44 58 52.3	122 52 46.6	3,939
T road east	44 58 17.1	122 52 35.7	3,653

CORVALLIS QUADRANGLE.

Along north border of quadrangle near Airlie.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Second-class road south in Albany quadrangle	44 44 40.3	123 14 32.9	.....
Angle in road south, end of tangent	44 44 40.2	123 15 31.6	4,240
Flagpole in front of schoolhouse	44 44 35.5	123 15 53.7	1,662
Fir Lawn farm, road opposite entrance to	44 44 36.3	123 17 07.3	5,310
Airlie, three mail boxes at Y road 1.5 miles east of	44 44 08.2	123 18 27.3	6,433
T road north	44 44 48.6	123 19 21.0	5,631
Airlie public school, north edge of road; iron post stamped "Prim. Trav. No. 15, Ore. 1913"	44 44 58.8	123 19 38.4	1,626

Magnetic declination, 22° 12′ E.

DALLAS QUADRANGLE.

From culvert 78 C north along Southern Pacific Railroad and highways to Dallas.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Culvert 78 C	44 45 21.8	123 19 37.7	.....
Road crossing 77 B C	44 46 25.4	123 19 00.2	6,989
Simpson, 15 feet north of track at road crossing; iron post stamped "Prim. Travs. T No. 16 Ore. 1913"	44 46 49.7	123 18 04.1	4,732
Signboard at T road south, "Airlie 4 miles, Corvallis 20 miles"	44 47 44.0	123 18 03.7	5,504
T road north, near cemetery	44 47 44.1	123 18 42.6	2,800
Telephone pole, north edge of road, opposite wagon shed	44 48 12.3	123 19 21.6	4,014
T road north	44 48 43.6	123 19 42.4	3,507
T road east, at signboard "Monmouth 6 miles, Calvary Church 6 miles, Dallas 7 miles"	44 49 48.7	123 20 36.7	7,666
Luckiamute River bridge, 500 feet east of, at crossroads; iron post stamped "Prim. Trav. No. 17, Ore. 1913"	44 50 26.2	123 21 44.2	6,175
T road west at signboard "Falls City 4 miles, Dallas 5 miles"	44 51 14.3	123 21 23.6	5,088
T road east	44 51 39.3	123 21 04.8	2,877
Schoolhouse, 500 feet northeast of, east edge of road; iron post stamped "Prim. Trav. No. 18, Ore. 1913"	44 52 21.5	123 20 10.2	5,812
Guthries's mail box, center of road, opposite	44 52 57.6	123 19 54.4	3,831
Summit	44 53 44.2	123 19 50.7	4,724
Cemetery gate, east entrance	44 54 32.4	123 19 47.9	4,884
Dallas, west end of north curb of Washington Avenue at intersection of Fairview Avenue	44 55 11.8	123 19 23.4	4,368
Dallas, in coping of steps at northwest corner of Polk County courthouse; bronze tablet stamped "Prim. Trav. 18, Ore. 1913"	44 55 17.6	123 18 54.6	2,156
Dallas, railroad crossing	44 55 41.1	123 18 42.6	2,534
Summit of hill opposite south end of gate	44 56 17.9	123 18 37.2	3,744
T road north	44 56 53.9	123 18 34.1	3,659
T road east	44 57 37.3	123 18 03.6	4,907
Dallas 3.5 miles north of, at T road south, east side of road at fence corner; iron post stamped "Prim. Trav. No. 19, Ore. 1913"	44 58 10.2	123 17 54.5	3,402
T road east	44 58 33.7	123 17 36.7	2,698
Large cottonwood tree, east side of road	44 59 32.1	123 17 11.6	6,184

Along highways east of Dallas.

Bowersville railroad crossing	44 54 59.9	123 15 25.2	.....
Chamberlain's mail box	44 55 06.5	123 16 23.2	4,223
T road south	44 55 05.9	123 17 38.2	5,402
Dallas, east end of north curb on Washington Street	44 55 11.8	123 18 30.0	3,777
Dallas, Polk County courthouse; flagpole	44 55 17.5	123 18 54.2	1,835

Magnetic declination, 22° 12′ E.

LEBANON QUADRANGLE.

Near bridge 197.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Center of track at road crossing	44 44 21.6	122 51 54.7	.....
Bridge 197, center of	44 44 43.3	122 51 23.8	3,130

McCOY QUADRANGLE.

Near Fairfield.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Center of road at T road east	45 08 35.7	123 00 12.6	.....
Fairfield, 60 feet north of store; iron post stamped "Prim. Trav. No. 83 Ore. 1913"	45 08 10.2	123 00 24.9	2,721

Magnetic declination, 22° 47′ E.

Along highways near southwest corner of quadrangle.

T road north	45 02 35.3	123 14 18.3	.....
Center of bridge	45 02 35.4	123 13 33.3	3,230
McCoy, north side of road, edge of railroad right of way, 500 feet north of station; iron post stamped "Prim. Trav. No. 21—Ore. 1913"	45 02 35.5	123 12 56.6	2,640
McCoy, church spire	45 02 31.2	123 13 00.7	523
Road crossing	45 02 36.7	123 12 22.3	2,814
T road west	45 01 49.6	123 12 23.1	4,773
Do	45 00 50.9	123 12 25.7	5,950

Magnetic declination, 21° 47′ E.

Along highway near south border of quadrangle.

White tank house on top of hill, west edge of road	45 00 23.7	123 04 40.4	.....
Salem, 6 miles north of, at northwest corner of school yard; iron post stamped "Prim. Trav. No. 25, 1913. Ore."	45 01 11.9	123 05 08.2	5,264
Angle in road, opposite gate leading south to field	45 00 55.4	123 06 36.8	6,579
Oak tree, south edge of road at T road north; tree has two sign boards, "Oak Grove, 5 miles"; "McCoy, 4.3 miles," etc	45 00 55.4	123 07 37.7	4,375
T road east	45 00 32.6	123 07 44.3	2,358
McKinley's orchard, T road south	45 00 20.5	123 08 09.8	2,203
Salem, about 8 miles northwest of, 0.3 mile north of John Smith's residence at top of hill, south edge of road; iron post stamped "Prim. Trav. No. 26, Ore. 1913"	45 00 08.1	123 09 00.9	3,872
Large gate post at south edge of road, northeast corner of field, 60 feet west of small drain	45 00 04.6	123 09 47.4	3,362

Magnetic declination, 21° 55′ E.

SHERIDAN QUADRANGLE.

Along east boarder of quadrangle near Perrydale.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T road east	45 00 15.8	123 16 46.2	.....
T road west	45 00 37.5	123 16 35.7	2,320
H. A. Lee's mail box	45 01 24.9	123 16 09.8	5,145
T road west	45 01 42.8	123 15 57.6	2,019
Perrydale, southeast intersection of crossroads; iron post stamped "Prim. Trav. No. 20, Ore. 1913"	45 02 33.9	123 15 18.6	5,880
Perrydale, Methodist Church spire	45 02 36.8	123 15 26.9	605

Magnetic declination, 21° 47′ E.

MOUNT ANGEL QUADRANGLE.

From Chemawa along Southern Pacific Railroad to Aurora, thence north.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Chemawa, mail crane	45 00 07.7	122 59 30.1	
Tank, Chemawa, U. S. C. & G. S. station	45 00 11.4	122 59 37.0	618
Road crossing	45 01 13.5	122 58 59.2	6,836
Do	45 01 43.3	122 58 37.3	3,407
Do	45 02 07.7	122 58 16.3	2,900
Brooks, 215 feet north of station, 11 feet east of track; iron post stamped "Prim. Trav. No. 35, Ore. 1913–183–13–1903"	45 02 55.9	122 57 34.6	5,732
Road crossing, 727 E–F	45 03 28.6	122 57 06.8	3,863
Road crossing, 728 C–D	45 04 24.8	122 56 18.3	6,680
Road crossing at end of tangent	45 04 52.6	122 55 54.3	3,305
Milepost 731, second post north of, iron post stamped "Prim. Trav. No. 47—Ore. 1913—182 B 1903"	45 05 53.6	122 54 39.6	8,176
Gervais, center of track opposite semaphore	45 06 33.1	122 53 51.1	5,306
Milepost 733, first post south of; iron post stamped "Prim. Trav. No. 48 1913, Ore. 1903–B"	45 07 08.4	122 53 06.8	4,779
Road crossing	45 08 07.4	122 51 54.1	7,922
Switch head	45 08 22.5	122 51 35.5	2,020
Woodburn, 210 feet south of station; iron post stamped "Prim. Trav. No. 49 Ore. 1913–181 B 1903"	45 08 34.4	122 51 20.0	1,636
Hofer station, switch head	45 09 14.0	122 50 31.6	5,302
Culvert, 737 A	45 09 50.6	122 49 46.1	4,934
Road crossing, 738 B–C	45 10 47.0	122 48 36.0	7,596
Hubbard, 240 feet north of station; iron post stamped "Prim. Trav. No. 56–Ore. 1913, 183–B–1903"	45 10 58.8	122 48 21.2	1,598
Switch head	45 11 12.6	122 48 04.1	1,862
Road crossing	45 12 06.6	122 46 57.0	7,270
Switch head	45 12 28.8	122 46 29.3	2,999
Hubbard, 3.2 miles northeast of, 15 feet east of track; iron post stamped "Prim. Trav. 57 Ore. 1913"	45 13 06.0	122 45 56.7	4,424
Track, opposite semaphore No. 7424	45 13 29.7	122 45 40.9	2,657
Aurora, water tank	45 13 48.2	122 45 16.8	2,537
Aurora, State Bank, in sidewalk near northwest corner; bronze tablet stamped "Prim. Trav. No. 58—Ore. 1913"	45 13 58.4	122 45 18.2	1,033
Aurora, schoolhouse flagpole	45 14 15.6	122 45 30.4	1,950
T road west	45 14 31.1	122 45 37.4	1,648

Magnetic declination, 22° 32′ E.

From Chemawa east along highways, thence north to Gervais.

Chemawa, 0.8 mile east of, northeast corner road crossing; iron post stamped "Prim. Trav. No. 44—Ore. 1913"	45 00 18.4	122 58 31.2	
Seven mail boxes at T road, north	45 00 19.1	122 56 51.4	7,170
T road, north	45 00 36.9	122 55 55.1	4,430
Hazel Green schoolhouse, 200 feet east of, north edge of road; iron post stamped "Prim. Trav. No. 45 Ore. 1913"	45 00 39.9	122 55 33.6	1,574
T road, south	45 00 36.8	122 54 19.0	5,372
Second-class cross roads	45 00 41.8	122 53 46.9	2,364
T road, south	45 00 38.1	122 52 59.2	3,448
Silverton, 4 miles west of, at southwest corner of crossroads, near church; iron post stamped "Prim. Trav. No. 46, Ore. 1913"	45 00 34.3	122 52 37.1	1,637
Second-class road west to white house	45 01 20.3	122 52 29.1	4,700
Signboard at road crossing, "Salem 12 miles, Mount Angel 4 miles, Selah Springs 4 miles"	45 01 54.2	122 52 22.6	3,463
Schoolhouse, 200 feet northeast of, north edge of road at T road south; iron post stamped "Prim. Trav. No. 54–Ore. 1913"	45 02 47.6	122 52 01.9	5,610
T road	45 03 03.7	122 51 57.3	1,663
Second-class road east, at top of short grade	45 04 05.2	122 51 14.5	6,939
West end of bridge, 500 feet east of old sawmill	45 04 17.0	122 51 24.1	1,382
Schoolhouse, 200 feet east of, north edge of road at T road north; iron post stamped "Prim. Trav. 55—Ore. 1913"	45 04 29.3	122 51 56.9	2,659
Center of road in front of double iron gate	45 04 51.0	122 52 59.6	5,010
Crossroads	45 04 50.1	122 53 18.3	1,341
Crossroads, Pacific highway, near large fir tree	45 05 39.7	122 54 14.8	6,451

Magnetic declination, 22° 30′ E.

MOUNT ANGEL QUADRANGLE—Continued.

From point near St. Paul south along highway to Gervais.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T road north	45 14 43.1	122 56 26.5	
Y road east	45 14 07.2	122 57 40.2	6,399
T road west	45 12 55.8	122 58 23.0	7,856
St. Paul, northeast corner of curb, in front of bank; bronze tablet stamped "Prim. Trav. No. 82—Ore. 1913"	45 12 41.8	122 58 33.5	1,598
St. Paul Church, cross on	45 12 43.8	122 58 38.6	423
Center of culvert near T road, east	45 11 52.7	122 59 00.0	5,397
Oak tree, west edge of road at T road, east	45 11 11.4	122 59 08.8	4,225
Oak tree, center of road	45 10 01.4	122 59 37.3	7,372
Second-class T road west, at slight angle in road	45 09 22.0	122 59 57.0	4,233
Mail box at small grove of fir trees	45 07 40.8	122 59 37.9	
T road west	45 06 57.8	122 58 11.9	7,543
T road east	45 07 25.8	122 57 52.6	3,162
St. Louis, white church spire, U. S. Coast and Geodetic Survey triangulation station	45 07 25.83	122 56 31.26	5,836
St. Louis Church, 100 feet east of iron post stamped "Prim. Trav. No. 84, Ore. 1913"	45 07 25.4	122 56 30.0	106
St. Louis Oregon Electric R. R. crossing at station	45 07 17.9	122 55 49.8	2,971
T road south	45 07 13.5	122 55 02.4	3,414
Gervais, center of track opposite semaphor	45 06 33.1	122 53 51.1	6,549

Magnetic declination, 22° 36′ E.

Near Champoeg.

Center of road, T road south	45 14 48.6	122 52 32.4	
Champoeg farm windmill	45 14 45.4	122 53 07.6	2,535
Old Champoeg store, at T road east; iron post stamped "Prim. Trav. No. 61 Ore. 1913"	45 14 57.4	122 53 48.7	3,183

Magnetic declination, 22° 50′ E.

From Woodburn to Silverton via Southern Pacific Railroad.

Woodburn, 210 feet south of station; iron post stamped "Prim. Trav. No. 49—Ore. 1913, 181 B 1903"	45 08 34.4	122 51 20.0	
Woodburn, large steel water tank	45 08 29.1	122 51 22.5	562
Road crossing	45 08 10.8	122 50 39.6	3,587
Second-class road crossing, end of tangent	45 07 57.9	122 50 06.9	2,687
North end of bridge 735 E	45 07 37.2	122 49 16.5	4,179
Townsend, 20 feet west of track at station signboard; iron post stamped "Prim. Trav. No. 50, Ore. 1913"	45 07 15.5	122 48 43.0	3,253
Road crossing	45 06 16.7	122 48 28.6	6,040
McKee, road crossing, 70 feet south of station	45 06 02.8	122 48 25.2	1,436
Switch head	45 05 07.7	122 48 12.1	5,655
Mount Angel, 900 feet north of station, west edge of right of way, at road crossing; iron post stamped "Prim. Trav. No. 51, Ore. 1913"	45 04 18.5	122 48 00.6	5,047
Mount Angel Church, cross on	45 04 04.6	122 47 37.2	2,190
Road crossing, 730 A-B	45 02 57.0	122 47 40.6	6,844
Road crossing	45 02 33.7	122 47 34.9	2,400
Downs, in north pier of railroad bridge; bronze tablet stamped "Prim. Trav. No. 52, Ore. 1913"	45 01 56.1	122 47 25.8	3,860
Road crossing	45 01 20.6	122 47 17.3	3,649
Switch head, south end	45 00 49.4	122 47 09.8	3,200
Silverton, center of track opposite semaphore	45 00 36.0	122 47 09.6	1,365
Road crossing, 726 D-E	45 00 16.1	122 47 58.9	4,078

Magnetic declination, 22° 30′ E.

TUALATIN QUADRANGLE.

Along highway near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Aurora, 2 miles north of, northwest intersection of crossroads; iron post stamped "Prim. Trav. No. 11 Ore. 1913, 190"	45 15 36.5	122 45 48.9	
Center of road at crossroads	45 15 36.5	122 46 43.8	3,937
Geo. Gooding's farmhouse, end cement walk	45 15 36.4	122 47 30.0	3,300
Butteville, Oregon Electric Ry. station, 100 feet south of, east edge of right of way, south side of road; iron post stamped "Prim. Trav. No. 59, 1913"	45 15 36.4	122 48 12.5	3,043
Center of road at crossroads	45 15 36.8	122 49 45.8	6,668
Butteville, northeast intersection of street, 15 feet southwest of Masonic Hall; iron post stamped "Prim. Travs. No. 60, Ore. 1913"	45 15 46.1	122 50 30.5	3,335
Hite & Owens mail box at T road west	45 15 23.0	122 50 29.2	2,338
G. W. Stephens mail box	45 15 01.7	122 51 34.8	5,167
Telephone pole, at east corner of school yard at Y road south (telephone pole is also t. b. m.)	45 15 03.4	122 54 03.2	
Culvert at angle in road	45 15 20.5	122 55 13.8	5,344
T road south	45 15 29.9	122 56 29.5	5,478
Newberg, 4 miles south of, Champoeg 2.5 miles west of, at T road north to Gearns Ferry; iron post stamped "Prim. Trav. No. 62, Ore. 1913"	45 15 29.9	122 56 44.6	1,080

Magnetic declination, 22° 50′ E.

Along highway near Newberg.

T road west	45 15 57.8	122 56 50.3	
Gearns Ferry, stump south edge road, 150 feet south of landing	45 16 09.2	122 57 05.8	1,603
Angle in road, northwest at top of hill	45 16 28.2	122 56 56.8	2,028
Y road on bridge	45 17 06.1	122 57 23.1	4,268
Newberg, intersection of Washington and Seventh streets	45 17 43.4	122 57 45.7	4,117
Newberg, intersection of River and First streets	45 18 03.2	122 58 04.4	2,401
Newberg, north entrance to city hall; bronze tablet stamped "Prim. Trav. No. 64, Ore. 1913"	45 18 03.0	122 58 28.6	1,729
Newberg, 150 feet east of station, west edge of sidewalk on Main street; iron post stamped "Prim. Trav. 63, Ore. 1913"	45 18 12.2	122 58 42.5	1,368

Magnetic declination, 22° 50′ E.

From Newberg via Southern Pacific Railroad to Tualatin.

Road crossing	45 18 26.4	122 58 11.3	
Road crossing, 24 F–G	45 18 56.9	122 57 04.0	5,710
Springbrook, in east foundation of railroad water tank; aluminum tablet stamped "Prim. Travs. 65 Ore. 1913"	45 19 06.4	122 56 43.3	1,759
Webb, center of track, opposite switch	45 19 27.4	122 55 39.8	5,013
West end bridge 22 F	45 19 13.7	122 55 18.8	2,038
Rex, northwest corner school yard; iron post stamped "Prim. Trav. No. 66, Ore. 1913"	45 19 01.2	122 54 29.2	3,766
Washington-Yamhill county line post	45 19 05.0	122 54 17.1	946
Chehalem depot, center track	45 19 39.2	122 53 19.1	5,396
Road crossing	45 20 18.6	122 52 27.0	5,448
Middleton, center of track, opposite station	45 20 41.0	122 51 49.2	3,523
Road crossing	45 21 01.1	122 51 06.9	3,646
Sherwood, 115 feet west of station at southwest corner of Carlson & Sherks general merchandise store; iron post stamped "Prim. Trav. No. 67, Ore. 1913"	45 21 22.0	122 50 27.7	3,507
Ford, opposite signboard	45 22 09.1	122 49 13.2	7,147
Cipole, road crossing	45 22 31.1	122 48 39.3	3,289
Herrman, north edge of right of way at fence corner; iron post stamped "Prim. Trav. No. 68, Ore. 1913"	45 22 54.7	122 47 40.2	4,850
Galbraith, "One Mile" post, end tangent	45 23 13.9	122 46 34.2	5,093
Tualatin, opposite east window	45 23 16.1	122 45 53.6	2,903
Tualatin River bridge, east pier	45 23 16.4	122 45 40.3	950
Galbraith, road crossing	45 23 16.9	122 45 22.1	1,300

Magnetic declination, 22° 50′ E.

TUALATIN QUADRANGLE—Continued.

Along Southern Pacific Railroad near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Road crossing	45 24 22.6	122 44 48.6	.....
Bonita, center of Southern Pacific R. R. track at road crossing	45 24 56.6	122 45 04.5	3,634
Trece, center of Southern Pacific R. R. track at road crossing	45 25 40.7	122 45 55.0	5,735
Tigard, center of Southern Pacific R. R. track at road crossing	45 25 53.0	122 46 11.5	1,715
Tigard, 0.5 mile northwest of; Oregon Electric Ry. and Southern Pacific R. R. crossing	45 26 15.8	122 46 47.0	3,430
Robinson, east edge of right of way, north edge of road, 150 feet north of station; iron post stamped "Prim. Trav. No. 69 Ore. 1913"	45 26 59.6	122 47 09.3	4,710
Road crossing	45 28 11.6	122 47 09.5	7,298
Switch head at junction of roads	45 29 14.6	122 48 04.6	7,491
Beaverton, 300 feet west of station, west edge of road crossing, 20 feet north of track; iron post stamped "Prim. Trav. No. 70, Ore. 1913"	45 29 16.4	122 48 19.2	1,061

Magnetic declination, 22° 40′ E.

Along Southern Pacific Railroad near north border of quadrangle.

Road crossing	45 29 22.3	122 49 18.0	.....
St. Mary's, center of track	45 29 24.6	122 49 40.1	1,585
Huber, road crossing	45 29 33.4	122 51 04.1	6,050
Aloha, south edge right of way, west edge of road; iron post stamped "Prim. Trav. No. 71, Ore. 1913"	45 29 38.9	122 51 59.6	3,991
Road crossing	45 29 44.5	122 52 49.5	3,600
Reedville, east of; road crossing, 15 B	45 29 48.4	122 53 27.8	2,755
Road crossing	45 29 51.7	122 53 59.2	2,261
Do	45 29 58.0	122 55 00.0	4,380
Witch Hazel, 150 feet east of station, north edge of right of way; iron post stamped "Prim. Trav. No. 72, Ore. 1913"	45 30 00.3	122 55 19.2	1,390

Along highways near west border of quadrangle.

South end of trestle	45 29 52.6	122 59 29.0	.....
Hillsboro, 2.5 miles south of, at T road north; iron post stamped "Prim. Trav. 74, Ore. 1913"	45 28 50.9	122 59 25.1	6,254
Cross roads	45 27 56.1	122 59 30.9	5,559
T road west	45 26 49.9	122 59 14.6	6,809
Laurel, 2 miles north of, north edge of Y road; iron post stamped "Prim. Trav. No. 75, Ore. 1913"	45 26 38.3	122 59 00.6	1,540
Tps. 1 and 2 S., Rs. 2 and 3 W., center of road, corner townships, near A. L. Grebs residence	45 26 01.5	122 59 26.0	4,144
Laurel, 25 feet north and 25 feet east of, corner secs. 6, 7, 1 and 12, T. 2 S., Rs. 1 and 2 W.; iron post stamped "Prim. Trav. No. 76, Ore. 1913"	45 25 09.9	122 59 25.8	5,230
T. 2 S., R. 2 W., corner secs. 5, 6, 7, and 8, T road south	45 25 09.4	122 58 11.5	5,300
T. 2 S., R. 2 W., quarter corner, north side sec. 8, T road	45 25 09.0	122 57 34.8	2,625
Center sec. 8, iron pin	45 24 43.1	122 57 34.6	2,631
Telephone pole at angle in road	45 24 42.2	122 56 57.4	2,651
Scholl's store, 60 feet south of, east edge of road at T road; iron post stamped "Prim. Trav. 77, Ore. 1913"	45 24 00.5	122 55 46.3	6,599
Crossroads	45 23 36.6	122 56 31.8	4,055
T road west	45 23 11.5	122 56 56.3	3,082
Do	45 22 26.0	122 57 15.6	4,820
T. 2 S., R. 2 W., stone quarter corner south side sec. 29 (corner is north end of clearing, 40 feet east of road at top of steep grade)	45 21 40.8	122 57 34.0	4,758
Newberg, 3 miles north of, top of hill at T road north, iron post stamped "Prim. Trav. No. 81, Ore. 1913"	45 20 59.4	122 58 11.1	4,968
M. M. Down's mail box at T road south	45 20 49.7	122 57 43.7	2,213
Large fir tree at center of road	45 20 31.0	122 57 59.9	2,240
T road south	45 19 50.8	122 58 21.4	4,357
T road east	45 18 51.5	122 58 21.4	6,000

Magnetic declination, 22° 40′ E.

TUALATIN QUADRANGLE—Continued.

From Scholls east along highways to Robinson.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T road east at store	45 24 31.6	122 55 17.6	
Tualatin River bridge, center	45 24 56.4	122 55 12.7	2,536
Fred Groner's mail box at T road south	45 25 25.4	122 54 59.7	3,079
Scholls, 2.5 miles northeast of, at T road north; iron post stamped "Prim. Trav. No. 78, Ore. 1913"	45 25 15.2	122 54 22.0	2,881
T road north	45 25 09.4	122 53 15.7	4,765
T road south	45 25 26.1	122 52 38.1	3,168
Center of crossroads on north and south township line	45 25 35.2	122 52 00.6	2,824
Robinson, 3.5 miles west of, at angle in road, northeast-east side of road; iron post stamped "Prim. Trav. No. 79, Ore. 1913"	45 25 35.1	122 50 50.3	5,016
Large fir tree at T road north	45 26 03.2	122 50 08.5	4,123
Second-class road north on apparent section line, between secs. 32 and 33	45 26 19.9	122 49 31.1	3,158
T road south on quarter-section line, in center of sec. 33	45 26 31.2	122 48 54.5	2,850
Olson's and G. F. West's mail boxes, on line between secs. 33 and 34	45 26 39.1	122 48 17.4	2,762

From Butteville north along highway to Sherwood.

T road east	45 15 57.9	122 50 53.4	
T. 3 S., R. 1 W., stone quarter corner, between secs. 29 and 32, center of road	45 16 28.8	122 51 21.3	3,710
Butteville, 2 miles north of, west edge of road, top of hill; iron post stamped "Prim. Trav. No. 85, Ore. 1913"	45 17 14.4	122 51 14.2	4,648
T road south	45 17 38.2	122 51 12.8	2,418
Center of bridge near angle in road, north	45 18 13.5	122 50 27.2	4,830
Crossroads, northwest intersection of; iron post stamped "Prim. Trav. No. 87, Ore. 1913" (county line and corner section stone, common to secs. 7, 8, 17, and 18, T. 3 S., R. 1 W., is 15 feet south of and 55 feet east)	45 19 04.4	122 50 45.4	5,318
T. 3 S., R. 1 W., stone, corner secs. 5, 6, 7, and 8	45 19 56.1	122 50 44.6	5,246
T road east	45 20 15.0	122 50 33.6	2,068
Crossroads	45 21 01.3	122 50 26.2	4,719

Magnetic declination, 22° 53′ E.

HILLSBORO QUADRANGLE.

[See also p. 520.]

Near Hillsboro.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Witch Hazel, 150 feet east of station, north edge of right of way, south edge of road; iron post stamped "Prim. Trav. No. 72, Ore. 1913"	45 30 00.3	122 55 19.2	
West end of bridge, near west end of tangent	45 30 09.5	122 56 50.6	6,570
Newton, center of track	45 30 22.9	122 57 30.2	3,132
Road crossing	45 30 37.6	122 58 05.6	2,929
Hillsboro, 400 feet west of station, south edge of right of way, northeast corner of Pacific Coast Condensed Milk Co. tank; iron post stamped "Prim. Trav. No. 73, Ore. 1913"	45 30 59.2	122 59 21.2	5,811
South end of highway trestle	45 30 14.4	122 59 24.8	4,537

Along highways near southeast corner of quadrangle.

Crossroads	45 30 07.1	122 48 18.3	
Gate to field at angle in road north	45 30 21.5	122 47 46.0	2,719
Center of road at northwest apex of triangle	45 30 53.6	122 47 40.6	3,577
Base line, stake at angle in road, northwest	45 31 12.6	122 47 58.9	2,078
Cedar mill, north edge of road at T road, 1 foot east of small gate leading to house; iron post stamped "Prim. Trav. No. 80, Ore. 1913"	45 31 31.9	122 48 27.7	2,841
Center of bridge	45 31 38.2	122 47 52.8	2,567
Multnomah-Washington county line, post	45 31 48.5	122 45 49.0	8,873
S. J. Osborn's mail box, at top of hill	45 31 57.6	122 45 13.6	2,680
Barnes, U. S. Coast and Geodetic Survey triangulation station	45 31 36.53	122 45 00.03	2,337

SALEM QUADRANGLE.

[See also pp. 505–508.]

From Salem southeast via Southern Pacific Railroad.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Salem, dome State capitol	44 56 19.5	123 01 43.5	
Salem, road crossing 717 I	44 55 38.1	123 01 37.5	4,210
Salem, road crossing 717 A	44 55 02.1	123 01 33.5	3,658
Salem, second-class road crossing, near Home for Feeble-Minded	44 54 21.6	123 00 46.2	5,334
Turner, 4.8 miles north of, 6 feet south of railroad crossing, 17 feet east of rail; iron post stamped "Prim. Trav. No. 28-Ore. 1913–207–1903"	44 54 02.1	123 00 14.8	3,011

Magnetic declination, 22° 30′ E.

From Salem east along highway.

Salem, intersection of State and Twenty-first streets, south center of track	44 56 04.8	123 00 55.3	
Salem, center of bridge	44 55 45.1	123 00 05.6	4,090
Salem, tall steel tank near State prison	44 56 21.2	123 00 03.6	3,657

Magnetic declination, 22° 30′ E.

From Salem via Southern Pacific Railroad to Chemawa.

Salem, center of track, intersection of Twelfth and Marion streets	44 56 30.4	123 01 26.6	
Salem, tile works, center of track, opposite signboard	44 57 23.4	123 00 55.8	5,807
Road crossing	44 57 40.9	123 00 45.7	1,920
Milepost 721, near east side of track; iron post stamped "Prim. Trav. No. 34, Ore., 1913–162 B 1903"	44 58 14.1	123 00 26.2	3,638

Along highways near northwest corner of quadrangle.

Railroad crossing	44 59 58.6	123 12 29.9	
Schoolhouse flagpole	44 59 24.5	123 12 54.1	3,874
Crowley station, 0.5 mile west of, at T road east, iron post stamped "Prim. Trav. No. 22, Ore., 1913"	44 58 39.8	123 13 06.4	4,611
T road east	44 58 09.2	123 13 14.9	3,159
Angle in road west	44 57 16.0	123 13 24.4	5,430
T road east	44 57 15.2	123 13 39.4	1,080
Second-class road east	44 56 16.0	123 13 39.2	6,000
Rickreall, east edge of road, and T road west; iron post stamped "Prim. Trav. 23, Ore., 1913"	44 55 49.2	123 13 38.8	2,704

Magnetic declination, 21° 51′ E.

Along highways north from Monmouth via Rickreall.

Monmouth Normal School, south side of step at east entrance; bronze tablet stamped "Prim. Trav. A 1913, Ore."	44 51 05.0	123 14 12.4	
Railroad crossing	44 51 56.1	123 14 14.8	5,181
Angle in road east	44 52 35.9	123 14 16.3	4,029
Angle in road north	44 53 07.2	123 14 11.2	3,186
Monmouth, 3.5 miles north of, at crossroads; iron post stamped "Prim. Trav. No. 3, Ore., 1913"	44 53 52.4	123 14 03.4	4,616
T road south	44 54 39.3	123 14 02.8	4,749
Rickreall station, railroad crossing	44 55 07.3	123 13 39.3	3,303
Rickreall, telephone pole 60 feet west of F. H. Begun's store	44 55 46.8	123 13 39.8	4,001
Derry, railroad crossing	44 55 46.4	123 12 46.2	3,851
T road south	44 55 47.9	123 11 46.9	4,269
Signboard at crossroads, "Independence 6 miles, Bethel 8 miles"	44 55 47.6	123 10 36.8	5,046
Large gate at angle in road north	44 55 53.4	123 09 54.1	3,126

Magnetic declination, 21° 57′ E.

SALEM QUADRANGLE—Continued.

From Salem along highway on west side of river.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T road west	44 57 13.5	123 03 06.0	
T road east	44 58 06.4	123 03 32.7	5,691
North side of road at west, one of two patent gates leading to pear orchard; iron post stamped "No. 24, Ore. 1913"	44 58 33.5	123 04 08.5	3,762
T road west	44 59 03.6	123 04 34.5	3,574
Wm. Calder's residence, large oak tree in front of	44 59 32.2	123 04 38.4	2,910
Along highway near Oak Grove Church.			
Oak Grove Church, 1 mile north of, 60 feet east of gate leading to farmhouse, in north abutment of culvert; bronze tablet stamped "Prim. Travs. No. 27, Ore. 1913"	44 59 15.3	123 10 16.5	
Oak Grove, T road west, 600 feet north of church	44 58 30.1	123 10 16.5	4,572
Oak Grove, church spire	44 58 23.7	123 10 18.3	664
Summit of hill, center of second-class road	44 58 33.0	123 11 38.5	5,836
Iron pin, at angle in road, near old hop drier	44 58 32.8	123 12 13.8	2,540
Crowley station, railroad crossing	44 58 39.9	123 12 26.6	1,157

Magnetic declination 21° 55′ E.

Hillsboro and St. Helens quadrangles.

COLUMBIA, MULTNOMAH, AND WASHINGTON COUNTIES.

The geographic positions in the following lists were determined by L. F. Biggs in 1914 and are based on the North American datum positions of the United States Coast and Geodetic Survey station Linnton and are also tied to primary traverse stations at Hillsboro and Cedar Mill, described below and on page 520. The State cooperated in the work.

HILLSBORO QUADRANGLE.

From Hillsboro north via highways near west edge of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Township corner, Willamette base line and Rs. 2 and 3 W	45 31 14.0	122 59 24.6	1,515
Hillsboro, intersection of First and Main streets (small manhole)	45 31 23.8	122 59 20.3	1,046
Hillsboro, near northeast corner of high-school yard, U. S. Coast and Geodetic Survey azimuth pier	45 31 43.8	122 59 01.4	2,425
Hillsboro, 0.7 mile northeast of; oak tree at T road east	45 32 14.0	122 58 43.5	3,314
Hillsboro, 1.5 miles northeast of; oak tree at T road north	45 33 02.4	122 58 21.7	5,145
Hillsboro, 2.5 miles northeast of; picket gate, leading to house at north end of tangent	45 33 55.1	122 58 18.5	5,340
Hillsboro, 3 miles northeast of; west edge of road at T road east; iron bench-mark post stamped "Prim. Trav. No. 1, 1914, Ore."	45 34 22.0	122 58 10.6	2,846
Angle in road north	45 34 56.8	122 57 54.3	3,708
North Plains, center of crossroads, 1 mile east of	45 35 44.2	122 58 05.6	4,872
North Plains, at crossroads at northeast corner of town; iron bench-mark post stamped "Prim. Trav. No. 2, 1914, Ore. B."	45 36 02.2	122 59 28.3	6,158
Center of road at range line crossing	45 35 57.2	122 59 24.0	592
Geo. Bantz's mail box (No. 65)	45 36 51.9	122 58 49.7	6,057
McKay Creek, center of bridge near angle in road north	45 37 32.6	122 58 27.8	4,415
North Plains, 2.6 miles north of; Shady Brook schoolhouse, 300 feet north of; west edge of road at T road east; iron bench mark post stamped "Prim. Trav. No. 3, 1914, Ore. B"	45 37 56.3	122 58 10.1	2,711
T. 2 N., R. 2 W., quarter corner south side sec. 19 (witness tree south edge of road)	45 38 11.2	122 58 46.4	2,989
Y road at south end of new grade	45 38 37.5	122 59 04.6	2,970
Center of bridge	45 39 16.4	122 58 34.7	4,478
Fir tree, west edge of road, blazed with triangle	45 39 18.8	122 58 12.0	1,624
Water wheel, second-class roads at	45 39 51.6	122 58 14.3	3,335
T. 2 N., R. 2 W., in NW. ¼ sec. 8, 75 feet south of road leading to John Zimmerman's ranch house, east edge of road; iron bench-mark post stamped "Prim. Trav. No. 18, 1914, Ore. B"	45 40 27.0	122 57 52.7	3,897

HILLSBORO QUADRANGLE—Continued.

From Hillsboro north via highways near west end of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
North end of lane on $\frac{1}{16}$ section line near John Zimmerman's residence	45 40 42.6	122 57 50.1	1,590
T. 2 N., R. 2 W., $\frac{1}{16}$ corner on line between secs. 5 and 6, 0.25 mile south of township line near road forks	45 41 24.7	122 58 09.0	4,469
Wallace schoolhouse, 50 feet south of, on township line, 670 feet east of corner section north side of secs. 5 and 6, T. 2 N., R. 2 W., west side of road at T road east; iron bench-mark post stamped "Prim. Trav. No. 19, 1914, Ore. B"	45 41 37.5	122 57 59.6	1,461
Milepost No. 1, north edge of road at small ravine	45 42 17.5	122 58 02.1	4,062
Road forks, 20 feet west of; small fir tree blazed triangle	45 42 50.9	122 58 09.0	3,418
Summit of hill, north edge of road; fir tree blazed triangle	45 43 26.7	122 58 45.3	4,448
Hub tie	45 43 40.1	122 59 09.8	2,211
Top of hill at junction of roads to Pumpkin Ridge and North Plains; iron bench-mark post stamped "Prim. Trav. No. 20, 1914, Ore. B"	45 43 51.3	122 59 31.8	1,929
Y road, down hill	45 44 22.4	122 58 43.8	4,634
Road forks	45 44 13.9	122 57 49.3	3,957
Nine-foot fir tree, south edge of road, about 500 feet east of road junction, leading up hill; blazed triangle	45 44 42.0	122 57 23.4	3,388

Magnetic declination along west border, 23° 40′ E.

Along north border of quadrangle.

Scappoose, 1 mile south of, east side of road at Smiths Corners; iron bench-mark post stamped "Prim. Trav. No. 12, 1914, Ore. B"	45 44 25.1	122 52 42.5	.....
Y road west	45 44 35.8	122 54 09.9	6,286
Canyon schoolhouse at southeast corner of yard, north edge of road; iron bench-mark post stamped "Prim. Trav. No. 14, Ore. B"	45 44 58.1	122 55 44.9	7,108

Magnetic declination along north border, 23° 30′ E.

From Cornelius Pass to Shady Brook schoolhouse.

Rail gate, west side of road, 500 feet north of house	45 37 00.4	122 52 16.9	.....
Center road, opposite large gate, east edge of road, about 500 feet south of schoolhouse	45 37 23.6	122 52 42.5	2,971
Angle in road at northwest corner of young orchard	45 37 52.4	122 52 55.2	3,053
Center road opposite southwest corner of picket fence 200 feet south of house	45 38 36.1	122 53 04.6	4,483
Triangle at T road	45 38 50.9	122 53 29.8	2,338
T. 2 N., R. 2 W., in NW. ¼ of sec. 14, at second-class road to A. Danielson's ranch house, north edge of road; iron bench-mark post stamped "Prim. Trav. No. 16, 1914, Ore. B"	45 39 28.5	122 54 05.9	4,590
Second-class Y road	45 39 15.7	122 54 58.9	3,978
Mason Hill schoolhouse, 350 feet northeast of south edge of road; bench-mark post stamped "Prim. Trav. No. 17, 1914, Ore. B"	45 38 38.0	122 55 28.9	4,373
T road west at fence corner	45 38 20.3	122 56 41.5	5,455

Magnetic declination in hills in center of quadrangle, 22° 51′ E.

From Linnton to Scappoose along granite highway.

Warning bell at railroad crossing	45 36 39.7	122 47.42.8	.....
Ban station, center of highway opposite	45 37 42.1	122 49 10.9	8,898
West end metal culvert, near top of hill	45 38 19.7	122 49 55.1	4,935
Burlington, granite highway milepost No. 13	45 38 50.9	122 50 33.8	4,189
Holbrook, 150 feet west of south end of switch 70 feet east of center of highway; iron bench mark (post) stamped "Prim. Trav. No. 10, 1914, Ore. B"	45 39 23.4	122 51 20.3	4,660
Granite highway milepost No. 15	45 40 06.6	122 52 02.5	5,309
Granite highway milepost No. 16	45 40 56.3	122 52 25.5	5,287
Rocky Point, 500 feet north of water tank, east side of road Y at road west; iron bench-mark post stamped "Prim. Trav. No. 11, Ore. 1914, B" 35–A	45 41 52.6	122 52 11.5	5,792
Granite highway milepost No. 18	45 42 37.0	122 52 24.1	4,579
Multnomah-Columbia county line, north edge sec. 25	45 43 18.2	122 52 28.3	4,183

Magnetic declination on east edge of hills, 22° 50′ E.

HILLSBORO QUADRANGLE—Continued.

From point near North Plains east and south via United Railways and highway to Cedar Mill.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Lincoln, center of road crossing	45 36 05.1	122 58 01.7	
Connell, road crossing, 500 feet west of station	45 35 56.3	122 56 52.9	4,970
Helvetia, 110 feet north of railroad, 175 feet northwest of station, east edge of wagon road; iron bench-mark post stamped "Prim. Trav. No. 4, 1914, Ore. B"	45 35 46.7	112 54 57.5	8,266
Bowers Junction, 1,500 feet southwest of, under track crossing	45 35 33.1	122 54 27.3	2,548
Road crossing	45 34 59.4	122 53 59.1	3,959
Do	45 33 33.9	122 53 53.9	8,674
Orenco, 1 mile north of; west edge of railroad right of way, south side of road at road crossing; iron bench-mark post stamped "Prim. Trav. No. 5, 1914, Ore. B"	45 32 17.9	122 53 57.0	7,694
Milk rack at Y road east	45 32 04.7	122 52 57.6	4,434
T. 1 N., Rs. 1 and 2 W., stone corner secs. 30, 31, 25 and 36, center of crossroads	45 32 04.6	122 51 59.8	4,111
Cedar Mill, 2 miles west of; south edge of road opposite Congregational Church; iron bench-mark post stamped "Prim. Trav. No. 6, 1914, Ore. B"	45 31 58.0	122 50 32.0	6,285
T road north, second-class road south	45 31 51.9	122 49 24.6	4,841

Magnetic declination, 23° 05′ E.

From point near Cedar Mill to Linnton.

T road north	45 32 35.2	122 49 39.8	
Triangle at Y roads	45 33 22.8	122 49 41.7	4,823
Cedar Mill, 3.5 miles northwest of, 100 feet east of church at northwest intersection of crossroads; iron bench-mark post stamped "Prim. Travs. No. 7, 1914, Ore. B."	45 34 01.5	122 50 06.3	4,298
Washington-Multnomah county line post, north side of sec. 17	45 34 40.5	122 50 16.5	4,012
Germantown road at cross roads	45 34 53.7	122 50 23.2	1,417
Sharp angle in road at J. E. Sharp's residence	45 35 12.1	122 49 36.8	3,792
Water trough, north edge of road	45 35 07.4	122 48 41.8	3,949
Cross roads at top of hill; iron bench-mark post stamped "Prim. Trav. No. 8, 1914, Ore. B"	45 35 00.6	122 47 55.0	3,398
Horseshoe bend, farthest point north	45 35 27.2	122 47 24.8	3,437
Water tank at junction of Linnton and Germantown roads at foot of hill	45 35 08.9	122 46 12.2	5,489
Linnton, 100 feet south of depot, east edge of railroad right of way; iron post stamped "Prim. Trav. No. 9, 1914, Ore. B."	45 35 58.2	122 47 02.5	6,140
Linnton, U. S. Coast and Geodetic Survey triangulation station on side of hill, 1,200 feet northwest of depot	45 36 02.3	122 47 19.81	1,300

From Bowers Junction via United Railways and highways to Burlington.

Undertrack crossing	45 35 55.4	122 53 26 2	
West end of trestle U 17 O over Rock Creek	45 36 14.1	122 52 47.3	3,350
Cornelius Pass, summit of hill at Y road north, iron bench-mark post stamped "Prim. Trav. No. 15, 1914, Ore. B."	45 36 34.4	122 51 44.0	4,952
West end of trestle U 15 7, 1,000 feet north of tunnel	45 36 58.9	122 51 31.5	2,633
Falkenburg station, center of track	45 37 49.7	122 51 38.9	5,176
West end of trestle, 13–8	45 38 48.3	122 51 11.5	6,256
Burlington, granite highway milepost 13	45 38 50.9	122 50 33.8	2,690

ST. HELENS QUADRANGLE.

[See also p. 516.]

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Scappoose, east side of track, south of depot; iron bench-mark post stamped "Prim. Trav. No. 12, 1914, Ore. B."	45 45 28.9	122 52 35.5	

TEXAS.

TRIANGULATION STATIONS.

Archer City, Eschite, Henrietta, and Walker quadrangles.

ARCHER, CLAY, AND WICHITA COUNTIES.

Late in the season of 1914 J. R. Ellis extended triangulation west from United States Coast and Geodetic Survey stations Cube and Myers on North American datum. Eighteen new stations were occupied and 14 points were located by intersections.

ARCHER CITY COURTHOUSE, ARCHER COUNTY, TEX. (Not occupied.)

Sighted from two stations only.
Station mark: Center of cupola.

[Latitude 33° 35′ 42.34″. Longitude 98° 37′ 29.84″.]

o station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Schrader	195 06 27	15 08 28	4.33196	13.345
Eskridge	210 22 59	30 27 26	4.38947	15.234

BLUFF, NEAR ARCHER-WICHITA COUNTY LINE, TEX.

On a prominent hill on land owned by Rosa Nitschke, located about 1.2 miles south of the Wichita Falls–Holliday wagon road and about 9 miles southwest of Wichita Falls.

Signal: A 15-foot upright carrying cross arms to which black cloth targets were attached. Signal is 2.2 feet southwest of station mark.

Station mark: A standard iron post projecting 8 inches above surface of ground, under which a small flat stone, with cross cut on one side, was buried.

[Latitude 33° 50′ 24.37″. Longitude 98° 38′ 23.28″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Holliday, Methodist Episcopal Church spire	57 34 09	237 32 24	3.75913	3.569
Riggs	62 52 40.67	242 48 08.57	4.1502967	8.783
Tree on hill	89 22 43	269 19 04	4.00504	6.286
Hamilton	96 42 46.37	276 33 49.03	4.3973160	15.512
Fowlkes	126 27 45.16	306 20 54.15	4.3714888	14.616
Iowa Park elevator	169 53 24	349 52 37	4.09058	7.655
Lindsey	185 54 39.24	5 55 22.37	4.2844554	11 962
Wichita	245 08 17.79	65 13 21.06	4.1877978	9.575
Schrader	312 43 29.48	132 46 00.28	3.9773246	5.898

BURKBURNETT SCHOOLHOUSE, WICHITA COUNTY, TEX. (Not occupied.)

Sighted from two points only.

Station mark: Center of cupola.

[Latitude 34° 05′ 38.20″. Longitude 98° 34′ 07.16″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Lindsey	27 00 11	206 58 31	4.00468	6.281
Friberg	315 21 52	135 25 37	4.16728	9.133

BYERS OIL DERRICK, NORTHEAST OF PEROLIA, CLAY COUNTY, TEX. (Not occupied.)

Sighted from two stations only.

Station mark: Center of derrick.

[Latitude 34° 01′ 35.06″. Longitude 98° 11′ 42.38″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Petrolia	59 27 42	239 26 38	3.53413	2.126
Lone oil derrick near Petrolia	73 40 05	253 38 00	3.77803	3.727

CUBE, CLAY COUNTY, TEX.

A station of the Coast and Geodetic Survey 9.5 miles south and 2.5 miles west of Henrietta, 3 miles east and 1.5 miles south of Hernville, near southeast corner of a tract of land designated as "Abstract No. 307, Montague County School Land Survey No. E," on land of M. Cueba, on highest part of hill between house and barn.

Azimuth and distances to points are as follows: To reference mark, in southeast corner of Cueba's land, a tile pipe filled with cement and 60-penny nail in top is 333° 16′ 39″, 223.174 meters; to east end of ridge of barn 21° 42′ 07″, 47.66 meters; to southwest corner of stone of chimney of house 236° 21′ 30″, 52.46 meters

Station mark is two tile pipes set one above the other, filled with cement and 60-penny nails in tops, top of pipe even with ground.

[Latitude 33° 55′ 37.314″. Longitude 98° 07′ 12.930″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Henrietta	29 32 12.91	209 29 41.63	4.1510695	8.799
Jolly	81 59 13.72	261 51 33.31	4.3306312	13.304
Maupin	84 04 06	264 00 48	3.96248	5.700
Water tank at pump station	120 37 28	300 34 07	4.02996	6.657
Petrolia	133 17 28.51	313 13 53.80	4.1318464	8.418
Monument	208 35 35.42	28 42 29.71	4.5969291	.....
Benton	229 22 00.48	49 29 49.40	4.4520790	.....
Blue	290 58 21.89	111 11 33.48	4.5925657	.....

DUNDEE, ARCHER COUNTY, TEX.

On land owned by Mr. E. E. Griffin, on a small red gravel butte about half a mile east of large stone school building at Dundee. Station is a little nearer east end of butte.

Signal: A 15-foot upright, carrying black cloth targets, 2 feet southeast of station mark.

Station mark: A standard iron post projecting 1 foot above surface.

[Latitude 33° 44′ 41.71″. Longitude 98° 53′ 35.02″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Hamilton	174 13 50.27	354 13 20.87	4.1307126	8.396
Fowlkes	190 22 32.32	10 24 09.74	4.3966652	15.489
Lone oil derrick	238 55 17	58 58 18	3.99132	6.091
Riggs	249 17 39.72	69 21 34.67	4.0655070	7.225

DUNDEE, LONE TREE ON HILL NORTHEAST OF, WICHITA COUNTY, TEX. (Not occupied.)

[Latitude 33° 50′ 20.64″. Longitude 98° 44′ 56.72″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Riggs	21 12 02	201 11 09	3.83231	4.223
Fowlkes	147 57 02	327 53 45	4.22045	10.323
Bluff	269 19 04	89 22 43	4.00504	6.286

ELECTRA, WICHITA COUNTY, TEX.

Situated on a high knob in the east part of Electra.

Signal: A 16-foot upright, carrying black cloth targets, 2.6 feet west of station mark.

Station mark: A standard iron post projecting 9 inches above surface, under which was buried a square-headed iron bolt ¾ inch in diameter by 9 inches in length.

[Latitude 34° 02′ 15.14″. Longitude 98° 54′ 21.13″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Hamilton	0 31 19.75	180 31 15.78	4.2790717	11.815
Electra elevator	58 11 26	238 10 56	3.20988	1.007
Tank in oil derrick	76 33 40	256 32 56	3.31325	1.278
New oil derrick	162 30 48	342 30 29	3.46821	1.826
Sunshine	255 12 51.48	75 16 31.67	4.0182932	6.481
Lone oil derrick	268 48 22	88 49 30	3.49744	1.953
Fowlkes	324 26 37.03	144 28 40.60	3.9892544	6.062

ELECTRA ELEVATOR, WICHITA COUNTY, TEX. (Not occupied.)

Station mark: Center of elevator.

[Latitude 34° 01′ 47.40″. Longitude 98° 55′ 14.84″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Electra	238 10 56	58 11 26	3.20988	1.007
Fowlkes	315 07 06	135 09 40	3.99971	6.209
Hamilton	356 11 51	176 12 20	4.26004	11.308

ELECTRA, NEW OIL DERRICK NORTHWEST OF, WICHITA COUNTY, TEX. (Not occupied.)

Sighted from two points only.
Station mark: Center of derrick.

[Latitude 34° 03′ 46.12″. Longitude 98° 54′ 55.57″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Electra	342 30 29	162 30 48	3.46821	1.826

ELECTRA, TANK IN OIL DERRICK NORTHWEST OF, WICHITA COUNTY, TEX. (Not occupied.)

Sighted from two stations only
Station mark: Center of tank.

[Latitude 34° 01′ 59.62″. Longitude 98° 55′ 39.12″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Electra	256 32 56	76 33 40	3.31325	1.278

ELECTRA, LONE OIL DERRICK EAST OF, WICHITA COUNTY, TEX. (Not occupied.)

Sighted from two points only.
Station mark: Center of derrick.

[Latitude 34° 02′ 17.26″. Longitude 98° 52′ 18.60″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Electra	88 49 30	268 48 22	3.49744	1.953

ESKRIDGE, ARCHER COUNTY, TEX.

On farm owned by Mrs. W. M. Fuller, about 8 miles south of Wichita Falls, about 4 miles south and 3.5 miles west of the northeast corner of Archer County. The southeast corner of residence occupied by Mr. Eskridge bears northwest from the station 185.1 feet.

Signal: A 16-foot upright, with black cloth targets tacked to cross-arms. Signal is 2.8 feet south and 10° W. of station mark.

Station mark: A stamped iron post projecting 8 inches above surface of ground, under which a round brown bottle was buried.

[Latitude 33° 47′ 08.56″. Longitude 98° 29′ 27.86″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Archer City courthouse	30 27 26	210 22 59	4.38947	15.234
Schrader	86 34 33.54	266 32 06.51	3.8334791	4.235
Wichita	181 01 49.72	1 01 54.59	4.0970216	7.769
Jolly	225 56 12.58	46 00 56.47	4.2606983	11.325
Edwards	285 56 05.19	106 02 14.97	4.2507210	11.068

FOWLKES, WICHITA COUNTY, TEX.

On a high ridge about 2.5 miles south of Fowlkes station.

Signal: A 15-foot upright, carrying black cloth targets, 2.9 feet north of station mark.

Station mark: A standard iron post projecting 9 inches above surface.

[Latitude 33° 57′ 57.49″. Longitude 98° 50′ 40.16″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Dundee	10 24 09.74	190 22 32.32	4.3966652	15.489
Hamilton	27 51 33.88	207 49 26.82	4.0977662	7.782
Electra elevator	135 09 40	315 07 06	3.99971	6.209
Electra	144 28 40.60	324 26 37.03	3.9892544	6.062
Sunshine	202 38 07.12	22 39 43.50	4.0599447	7.133
Lindsey	255 59 38.00	76 07 13.13	4.3330507	13.378
Iowa Park elevator	276 11 28	96 17 32	4.22679	10.475
Bluff	306 20 54.15	126 27 45.16	4.3714888	14.616
Lone tree on hill	327 53 45	147 57 02	4.22045	10.323
Riggs	342 38 48.71	162 41 06.87	4.3300916	13.287

FRIBERG CHURCH, CLAY COUNTY, TEX.

About 7 miles northeast of Wichita Falls. Theodolite was mounted in church belfry and observations taken during a high wind.

Signal: Center of Friberg Church spire.

Station mark: Center of Friberg Church spire.

[Latitude 33° 59′ 58.55″. Longitude 98° 27′ 24.74″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Wichita	14 40 27.32	194 39 23.45	4.0644730	7.208
Lindsey	95 37 34.28	275 32 09.18	4.1757277	9.313
Sullivan	126 03 03.04	305 57 39.55	4.2628997	11.383
Burkburnett schoolhouse	135 25 37	315 21 52	4.16728	9.133
Petrolia	266 36 23.80	86 44 06.61	4.3277977	13.217
Jolly	318 03 03.24	138 06 39.15	4.1720189	9.234

GLASS FACTORY, WATER TANK, WICHITA COUNTY, TEX. (Not occupied; position not checked.)

On high wooden tower at glass factory southwest of Wichita Falls.

Station mark: Center of water tank.

[Latitude 33° 52′ 50.62″. Longitude 98° 32′ 08.37″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Schrader	13 43 23	193 42 25	4.05191	7.003
Wichita	245 42 11	65 43 45	3.67865	2.965

HAMILTON, WICHITA COUNTY, TEX.

On a sharp rocky hill on the divide between the forks of Wichita River. On land owned by Mr. Hamilton about half a mile south of his residence.

Signal: A 15-foot upright carrying black cloth targets S. 21° 27′ W. of and 2.2 feet distant from station mark.

Station mark: A bronze tablet set in top of a large bowlder which projects 8 inches above surface.

[Latitude 33° 51′ 58.04″. Longitude 98° 54′ 27.87″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Electra elevator	176 12 20	356 11 51	4.26004	11.308
Electra	180 31 15.98	0 31 19.75	4.2790717	11.815
Fowlkes	207 49 26.82	27 51 33.88	4.0977662	7.782
Bluff	276 33 49.03	96 42 46.37	4.3973160	15.512
Riggs	307 19 30.66	127 23 55.40	4.1871801	9.562
Dundee	354 13 20.87	174 13 50.27	4.1307126	8.396

HENRIETTA, CLAY COUNTY, TEX.

Signal and station mark: Center of cupola on courthouse.

[Latitude 33° 48′ 57.36″. Longitude 98° 11′ 44.36″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Myers	12 54 53.86	192 53 10.25	4.3328974	13.374
Edwards	51 09 16.93	231 05 35.59	4.1191566	8.175
Jolly	123 14 27.15	303 09 18.63	4.2307367	10.570
Lone oil derrick	165 14 26	345 12 18	4.35022	13.918
Maupin	169 17 30	349 16 43	4.06340	7.190
Petrolia	172 22 00.53	352 20 57.57	4.3384627	13.546
Cube	209 29 41.63	29 32 12.91	4.1510695	8.799

HOLLIDAY M. E. CHURCH SPIRE, ARCHER COUNTY, TEX. (Not occupied.)

Station mark: Center of church spire.

[Latitude 33° 48′ 44.36″. Longitude 98° 41′ 31.75″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Riggs	66 27 46	246 24 58	3.92595	5.240
Bluff	237 32 24	57 34 09	3.75913	3.569
Schrader	285 50 19	105 54 35	4.08948	7.635

IOWA PARK ELEVATOR, WICHITA COUNTY, TEX. (Not occupied.)

[Latitude 33° 56′ 58.00″. Longitude 98° 39′ 47.50″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Fowlkes	96 17 32	276 11 28	4.22679	10.475
Lindsey	210 32 51	30 34 27	3.91132	5.066
Bluff	349 52 37	169 53 24	4.09058	7.655

JOLLY, CLAY COUNTY, TEX.

On land owned by J. T. White, 2.2 miles due north of Jolly post office. Mr. White's residence is on a prominent hill, and the station is 10 feet north and 4 feet west of his windmill and just west of the residence. Instrument elevated 20 feet.

Signal: Center of steel windmill tower in garden; 10.4 feet distance from signal to station mark.

Station mark: An iron post set in Mr. White's garden 10 feet north and 4 feet west of windmill and well. A round quart bottle was buried under bench-mark post.

[Latitude 33° 53′ 59.67″. Longitude 98° 20′ 58.12″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Eskridge	46 00 56.47	225 56 12.58	4.2606983	11.325
Wichita	89 18 11.01	269 13 31.59	4.1096878	7.999
Friberg	138 06 39.15	318 03 03.24	4.1720189	9.234
Lone oil derrick	214 33 33	34 36 38	4.17585	9.315
Petrolia	222 36 35.71	42 40 41.98	4.2230102	10.384
Maupin	260 18 07	80 22 29	4.08810	7.611
Cube	261 51 33.31	81 59 13.72	4.3306312	13.304
Henrietta	303 09 18.63	123 14 27.15	4.2307367	10.570
Edwards	347 09 15.62	167 10 42.26	4.2558103	11.199

DUNDEE OIL DERRICK, ARCHER COUNTY, TEX. (Not occupied.)

Lone oil derrick 6 miles northeast of Dundee. Sighted from two points only.
Station mark: Center of derrick.

[Latitude 33° 47′ 25.82″. Longitude 98° 48′ 08.69″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Dundee	58 58 18	238 55 17	3.99132	6.091
Riggs	290 58 16	110 59 10	3.42439	1.651

EDWARDS, CLAY COUNTY, TEX.

On land owned by Dr. A. B. Edwards on the east side of the Henrietta-Halsell wagon road, about 3 miles northeast of Halsell station and three-quarters of a mile southwest of the road crossing of the Southwestern Railway at a spur. Perpendicular distance from center of wagon road southeast to station is 208 feet.

Signal: A 12-foot tripod covered on three sides with white cloth and centered over station mark.

Station mark: A stamped iron post set in center of small mound in pasture, under which a small sandstone, with cross cut on one face, was buried.

[Latitude 33° 44′ 29.33″. Longitude 98° 18′ 22.46″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Eskridge	106 02 14.97	285 56 05.19	4.2507210	11.068
Jolly	167 10 42.26	347 09 15.62	4.2558103	11.199
Henrietta	231 05 35.59	51 09 16.93	4.1191566	8.175
Myers	336 48 19.47	156 50 16.75	4.1410935	8.599

LINDSEY, WICHITA COUNTY, TEX.

In Mr. Joseph Lindsey's orchard, 7 miles south and 2 miles west of Burkburnett station, is about 2 feet west of the east garden fence and due west of the northwest corner of Mr. Lindsey's residence.

Signal: A 15-foot upright carrying black cloth targets, 2.5 feet northwest of station mark.

Station mark: A standard iron post projecting 9 inches above surface.

[Latitude 34° 00′ 45.86″. Longitude 98° 37′ 06.02″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Bluff	5 55 22.37	185 54 39.24	4.2844554	11.962
Iowa Park elevator	30 34 34	210 33 08	3.91132	5.066
Willard oil derrick	75 07 01	255 03 36	3.98848	6.051
Fowlkes	76 07 13.13	255 59 38.00	4.3330507	13.378
Sunshine	108 13 47.15	288 07 47.90	4.2387939	10.768
Sullivan	180 33 09.39	0 33 11.35	3.9690418	5.786
Burkburnett schoolhouse	206 58 31	27 00 11	4.00468	6.281
Friberg	275 32 09.18	95 37 34.28	4.1757277	9.313
Wichita	316 34 09.94	136 38 30.73	4.2418001	10.843

MAUPIN, CLAY COUNTY, TEX. (Not occupied.)

Petrolia, 6.5 miles south of, at southeast corner of T road south on Petrolia–Henrietta road.

Signal and station mark: A pole nailed to corner fence post.

[Latitude 33° 55′ 06.40″. Longitude 98° 13′ 08.08″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Jolly	80 22 29	260 18 07	4.08810	7.611
Petrolia	175 49 40	355 49 24	4.01131	6.378
Cube	264 00 48	84 04 06	3.96248	5.700
Henrietta	349 16 43	169 17 30	4.06340	7.190

MYERS, CLAY COUNTY, TEX.

A Coast Survey station 14 miles S. 12° 30′ W. of Henrietta, 3.5 miles S. 8° W. of Blue Grove, between Henrietta and Antelope road to northwest and Henrietta and Jacksboro road to east, on wooded ridge, S. 76° W., 413 meters of W. H. Myers's house, and N. 7° 35′ E., 185 meters of broken rocky bluff at end of hill, about 140 meters northeast of highest part of hill, on land known as Carleton Thompson survey, owned by W. H. Myers. Azimuths and distances to points are: Reference mark, in center of a rocky break, 28 meters south of north end of central promontory, is a hole ½ inch in diameter, by 3 inches deep circumscribed by an equilateral triangle (one point directed to station), 10 inches on a side, deeply cut in top surface of a prominent rock and filled with concrete; azimuth, 8° 17′ 57.2″, 156.174 meters; to west gable of Myers's house, 256° 55′, 413 meters.

Station mark: A hole 6 inches deep, 6 inches in diameter, filled with concrete with a spike in it; above this are 2 tile pipes filled with cement, and 6-penny nails in tops, top of top pipe even with ground, and both incased in concrete.

[Latitude 33° 37′ 36.423″. Longitude 98° 14′ 50.995″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Edwards	156 50 16.75	336 48 19.47	4.1410935	8.599
Lone oil derrick	178 46 02	358 43 38	4.62990	26.500
Henrietta	192 53 10.25	12 54 53.86	4.3328974	13.374
Cube	199 27 15.03	19 31 29.70	4.5480950	.....
Blue	248 10 54.37	68 28 17.12	4.7164528	.....

PETROLIA, CLAY COUNTY, TEX.

Flagstaff on center of cupola to Petrolia high school. Instrument was set in schoolhouse belfry.

Signal and station mark: Flagstaff on Petrolia high school.

[Latitude 34° 00′ 38.64″. Longitude 98° 13′ 37.21″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Jolly	42 40 41.98	222 36 35.71	4.2230102	10.384
Friberg	86 44 06.61	266 36 23.80	4.3277977	13.217
Lone oil derrick	91 01 57	271 00 56	3.44875	1.746
Byers oil well	239 26 38	59 27 42	3.53413	2.126
Cube	313 13 53.80	133 17 28.51	4.1318464	8.418
Water tank at pumping station	350 26 34	170 26 48	3.58938	2.414
Henrietta	352 20 57.57	172 22 00.53	4.3384627	13.546
Maupin	355 49 24	175 49 40	4.01131	6.378

PETROLIA, WATER TANK AT PUMPING STATION NEAR, CLAY COUNTY, TEX. (Not occupied.)

[Latitude 33° 58′ 34.30″. Longitude 98° 13′ 12.10″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Petrolia	170 26 48	350 26 34	3.58938	2.414
Cube	300 34 07	120 37 28	4.02996	6.657

PETROLIA, LONE OIL DERRICK WEST OF, CLAY COUNTY, TEX. (Not occupied.)

Station mark: Center of derrick.

[Latitude 34° 00′ 40.26″. Longitude 98° 15′ 26.70″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Jolly	34 36 38	214 33 33	4.17585	9.315
Byers oil derrick	253 38 00	73 40 05	3.77803	3.727
Petrolia	271 00 56	91 01 57	3.44875	1.746
Henrietta	345 12 18	165 14 26	4.35022	13.918

RIGGS, ARCHER COUNTY, TEX.

On the highest part of a ridge of land owned by Mr. H. C. Riggs, about 1 mile east of Mankins station.

Signal: A 15-foot upright carrying black cloth targets, 2.5 feet southeast of station mark.

Station mark: A standard iron post projecting 9 inches above surface, under which a flat conglomerate stone 6 inches in diameter was buried.

[Latitude 33° 46′ 54.95″. Longitude 98° 46′ 32.26″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Dundee	69 21 34.67	249 17 39.72	4.0655070	7.225
Lone oil derrick	110 59 10	290 58 16	3.42439	1.651
Hamilton	127 23 55.40	307 19 30.66	4.1871801	9.562
Fowlkes	162 41 06.87	342 38 48.71	4.3300916	13.287
Tree on hill	201 11 09	21 12 02	3.83231	4.223
Bluff	242 48 08.57	62 52 40.67	4.1502967	8.783
Holliday Methodist Episcopal Church	246 24 58	66 27 46	3.92595	5.240
Schrader	269 54 42.12	90 01 44.70	4.2912176	12.150

SCHRADER, ARCHER COUNTY, TEX.

On the highest part of a bare hill on John Schrader's farm, about 1.75 miles northwest of Hoff station and about 0.7 mile north of Schrader's residence.

Signal: A 16-foot upright carrying cross arms, to which black cloth targets were attached. Signal is 2.4 feet southwest of station mark.

Station mark: A standard iron post projecting 9 inches above surface of ground, under which a small bottle was buried.

[Latitude 33° 46′ 55.27″. Longitude 98° 33′ 52.28″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Archer City courthouse	15 08 28	195 06 27	4.33196	13.345
Riggs	90 01 44.70	269 54 42.12	4.2912176	12.150
Holliday Methodist Episcopal Church	105 54 35	285 50 19	4.08948	7.635
Bluff	132 46 00.28	312 43 29.48	3.9773246	5.898
Water tank at glass factory	193 42 25	13 43 23	4.05191	7.003
Wichita	208 31 30.96	28 34 03.08	4.1672407	9.133
Eskridge	266 32 06.51	86 34 33.54	3.8334791	4.235

SULLIVAN, WICHITA COUNTY, TEX.

On Mr. J. Sullivan's farm 2 miles southwest of Burkburnett and just north of the Burkburnett-Electra wagon road. Station is about 600 feet west of Mr. Sullivan's residence.

Signal: A 15-foot upright carrying black cloth targets, 2.5 feet southwest of station mark.

Station mark: A standard iron post projecting 9 inches above surface.

[Latitude 34° 05′ 48.07″. Longitude 98° 37′ 02.52″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Lindsey	0 33 11.35	180 33 09.39	3.9690418	5.786
Sunshine	76 46 21.14	256 40 19.54	4.2304723	10.564
Grandview water tower	156 26 35	336 24 19	4.18972	9.618
Devol water tower	193 49 03	13 49 59	4.03186	6.687
Friberg	305 57 39.55	126 03 03.04	4.2628997	11.383

SUNSHINE, WICHITA COUNTY, TEX.

At southeast corner of Sunshine school yard, on a prominent hill. Station is just north of the Burkburnett-Electra wagon road, about 8 miles northeast of Electra and about 12 miles southwest of Burkburnett, 21 feet east and 18 feet north to corner of school fence.

Signal: A 15-foot upright carrying black cloth targets.

Station mark: A standard iron post projecting 9 inches above surface, under which a brickbat was buried.

[Latitude 34° 03′ 41.36″. Longitude 98° 47′ 47.87″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Fowlkes	22 39 43.50	202 38 07.12	4.0599447	7.133
Electra	75 16 31.67	255 12 51.48	4.0182932	6.481
Grandview water tower	209 43 25	29 47 12	4.31886	12.948
Devol water tower	233 01 48	53 08 44	4.37840	14.851
Sullivan	256 40 19.54	76 46 21.14	4.2304723	10.564
Lindsey	288 07 47.90	108 13 47.15	4.2387939	10.768
Willard oil derrick	318 14 33	138 17 07	4.02546	6.589

WICHITA FALLS ELEVATOR, WICHITA COUNTY, TEX.

Situated in the city of Wichita Falls, on top of the Kemp and Kell concrete grain elevator.

Signal: An upright carrying targets of black cloth, which was centered over the station mark.

Station mark: Center of the iron tubing for supporting flagstaff on top of elevator.

[Latitude 33° 53′ 54.31″. Longitude 98° 29′ 19.11″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Eskridge	1 01 54.59	181 01 49.72	4.0970216	7.769
Schrader	28 34 03.08	208 31 30.96	4.1672407	9.133
Water tank at glass factory	65 43 45	245 42 11	3.67865	2.965
Bluff	65 13 21.06	245 08 17.79	4.1877978	9.575
Lindsey	136 38 30.73	316 34 09.94	4.2418001	10.843
Friberg	194 39 23.45	14 40 27.32	4.0644730	7.208
Jolly	269 13 31.59	89 18 11.01	4.1096878	7.999

WILLARDS OIL DERRICK, WICHITA COUNTY, TEX. (Not occupied.)

Sighted from two stations only.

Station mark: Center of derrick.

[Latitude 33° 59′ 24.53″. Longitude 98° 43′ 12.72″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Sunshine	138 17 07	318 14 33	4.02546	6.589
Lindsey	255 03 36	75 07 01	3.98848	6.051

PRIMARY TRAVERSE.

Dallas quadrangle.

DALLAS AND WAXAHATCHIE COUNTIES.

The following geographic positions on approximate North American datum were determined by primary traverse in 1915 by E. L. McNair. They are based on Trinity River traverse of the United States Corps of Engineers.

DALLAS QUADRANGLE.

Along river bottoms on south side of Trinity River.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Crabtree Ferry, about 2 miles below, by road, 500 feet north of a cabin, 10 feet west of river bank and between it and roadway, telephone line passes nearly over bench mark; an iron post 15 inches long set in concrete monument, 4 feet long. It is not as yet marked with elevation or number	32 32 34.52	96 31 45.13	.....
Crabtree Ferry, 2.30 miles below, about 400 feet southeast of negro cabin, at right angle in road and telephone line; in concrete monument 4 feet long and 1 foot square, an iron post 15 inches long. No number or elevation marked on post	32 32 32.15	96 31 50.29	888
South side of road and telephone line on root of oak tree (tack in) notch. Is station No. 108 of "Trinity River Traverse" of 1912	32 32 24.40	96 32 05.97	1,552
T road corners, in notch on root of oak tree. Is station No. 107 of "Trinity River Traverse" of 1912	32 32 20.14	96 32 15.49	919

DALLAS QUADRANGLE—Continued.

Along river bottoms on south side of Trinity River—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
River bank, 70 feet southwest of, 50 feet southwest of level T. B. M. on hackberry tree, near road and telephone line in (tack) a notch cut in root of elm tree. Is station 106 of Trinity River Traverse of 1912	32 32 30.63	96 32 38.00	2,200
T. b. m. No. 1 close to edge of woods in wire fence line azimuth of which is 60° and 240°; an elm tree, blazed, scribed, and painted black, "U. S. B. M. No. 1," nail in root of	32 32 36.95	96 33 04.47	2,354
T. b. m. No. 2, at corner of clearing and edge of woods in wire fence azimuth of which is 60° and 240°; in root of hackberry tree, blazed, scribed, and painted black, "U. S. B. M. No. 2," nail	32 32 37.26	96 33 37.39	2,817
T. b. m. No. 3, 30 feet south of road in edge of timber clearing on west; in root of Bois d'Arc tree blazed, scribed, and painted black "U. S. B. M. No. 3," nail	32 32 42.50	96 34 00.57	2,055
T. b. m. No. 4, 300 feet east of bridge across Tenmile Creek, just south of road; in root of elm tree blazed, scribed, and painted black "U. S. B. M. No. 4," nail	32 32 30.15	96 34 26.44	2,542
T. b. m. No. 21, 20 feet south of the Ferris and Crabtree Ferry road, near west side of Trinity River bottom land, 15 feet west of a neighborhood road, running south, 8 feet south of corner post of wire fence and 2 feet east of fence; an iron post stamped "Prim. Trav. Sta. No. 21, 1915"	32 32 17.80	96 34 51.85	2,508
T. b. M. No. 5, in edge of woods, 50 feet north of levee which runs 60° and 240° in azimuth, between open field and woods; in root of hackberry tree blazed, scribed, and painted black, "U. S. B. M. No. 5," nail	32 32 37.13	96 35 21.82	3,223
P. b. m. No. 22, on straight road leading to river, between the Ferris-Crabtree Ferry road and road to Lock No. 4, at foot of hill near edge of bottom, on north side of road, 1 foot from wire fence and south 54° west and 50 feet distance from a large leaning pecan tree marked with three hack; iron post stamped "Prim. Trav. Sta. No. 22, 1915"	32 32 40.99	96 35 56.22	2,970
T. b. m. No. 6, in open cultivated field 40 feet west of a small house; in root of elm tree, blazed, scribed, and painted black, "U. S. B. M. No. 6"	32 33 07.62	96 36 02.97	2,751
T. b. m. No. 7, 0.25 mile northeast from foot hills, on north side of road leading straight northeast from foot hills to Lock No. 4; in root of pecan tree standing alone; tree is blazed, scribed, and painted black, "U. S. B. M. No. 7," nail	32 33 30.01	96 36 20.23	2,702
P. b. m. No. 23, about 0.75 mile below public road bridge over Ten Mile Creek and about 500 feet north of creek, 20 feet west and 10 feet south of corner of house of W. E. Nix, on point of hill between Trinity River and Tenmile Creek bottoms; iron post stamped "Prim. Trav. Sta. No. 23, 1915"	32 33 55.48	96 36 29.03	2,683
T. b. m. No. 8, 1,200 feet northwest of a small graveyard, and at about the edge of foothills and bottom land; in root of large cottonwood tree, scribed, blazed, and painted black, "U. S. B. M. No. 8," nail	32 34 20.77	96 36 47.05	2,983
T. n. m. No. 9, about 0.75 mile below Hurley's store at gravel slough, in root of pecan tree at edge of foothills; tree is blazed, scribed, and painted black, "U. S. B. M. No. 9," nail	32 34 50.99	96 36 39.98	3,114
P. T. No. 24, 240 feet east of iron bridge over slough 10 feet south and 5 feet west of corner of Hurley's store building at Gravel Slough; iron post stamped "Prim. Trav. Sta. No. 24, 1915"	32 35 20.90	96 36 20.53	3,451
T. b. m. No. 10, about 0.25 mile west of Malloy bridge over Trinity River, 0.25 northwest of Mr. Perry's house, in wire fence line; in root of elm tree, blazed, scribed, and painted black, "U. S. B. M. No. 10," nail	32 35 39.59	96 35 40.65	3,900
T. b. m. No. 11, about 600 feet south and west of Mr. Perry's house, near small slough bridge; in root of elm tree; blazed, scribed, and painted black, "U. S. B. M. No. 11," nail	32 35 17.79	96 35 28.73	2,427
T. b. m. No. 12, near corner of woods, close to wire fence line bearing northeast and southwest on southeast side of road; in root of elm tree, blazed, scribed, and painted black, "U. S. B. M. No. 12," nail	32 35 01.94	96 35 25.29	1,631
T. b. m. No. 13, about 200 feet west of river bank, 50 feet south of cabin belonging to Mr. Carpenter of Ferris; in root of oak tree, blazed, scribed, and painted "U. S. B. M. No. 13," nail	32 34 42.20	96 34 56.69	3,158
Lock No. 4, in concrete foundation of corner fence post of Government reservation at cross. About 8 inches south of iron pipe in center of concrete, and is south 37° west and distant 163 feet from southwest corner of lock keeper's house. This point is station No. 89 of U. S. Corps of Engineers, traverse of 1912. Magnetic declination 9° 08′ east. Tie line across circuit.	32 34 20.79	96 34 33.13	2,960
Station 36 at t. b. m.	32 33 30.06	96 36 20.16	.....
T. b. m. No. 14, 1.14 miles S. 60° W. from Lock No. 4, close to middle of Ferris-Lock No. 4 road; in root of elm tree, blazed and marked in red "U. S. B. M. No. 14," nail	32 33 52.51	96 35 34.07	4,551
Station 89 (1912 traverse U. S. Corps of Engineers)	32 34 20.79	96 34 33.13	.....

DALLAS QUADRANGLE—Continued.

Across river bottom from Trinity River to Parsons Slough.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Dallas, Kaufman, and Ellis counties, corner of, on east line of C. W. Harris's land, at corner of wire fence; marked by a Bois d'Arc post about 8 inches square, 30 inches above surface of ground	32 32 36.87	96 31 22.08	.....
T. b. m. No. 19, about 700 feet east of river, in woods; in root of oak tree blazed, scribed, and painted black, "U. S. B. M. 19," nail	32 32 12.41	96 31 20.20	2,477
T. b. m. No. 20, about 150 feet north of river bank; in root of hackberry tree blazed, scribed, and painted black, "U. S. B. M. 20," nail	32 32 11.27	96 30 48.62	2,706
T. b. m. No. 21, in thick woods; in root of elm tree blazed, scribed, and painted black "U. S. B. M. 21," nail	32 32 07.88	96 30 25.11	2,042
T. b. m. No. 22, 5 feet from west bank of Parsons Slough; at base of dead ash tree blazed, scribed, and painted black, "U. S. B. M. 22," nail	32 32 05.61	96 30 07.99	1,484

At edge of river bottom on east side of Parsons Slough.

P. b. m. No. 25, 250 feet east of bank of Parsons Slough, above thick woods, at lower end of Chester Harlan's field, 2 feet north of wire fence running southwesterly, 10 feet northeast of large oak tree marked with three hacks; iron bench-mark post stamped "Prim. Trav. Sta. No. 25, 1915"	32 32 34.54	96 30 02.89	2,956
T. b. m. No. 23, about 50 feet north of edge of woods and lowland, and 15 feet west of wire fence line; in root of spotted-oak tree blazed, scribed, and painted black "U. S. B. M. 23," nail	32 32 54.88	96 30 17.59	2,410
T. b. m. No. 24, on land of Dr. Glenn at Seagoville, 12 feet northwest of fence line; in root of dead post-oak tree blazed, scribed, and painted black, "U. S. B. M. 24," nail	32 33 20.88	96 30 24.02	2,685
P. b. m. No. 26, on the Ferris-Crabtree-Terry and Seagoville road, about 3 miles north of Parsons Slough Bridge, 50 feet north of flat bottom land, 2.5 feet from wire fence line; iron bench-mark post stamped "Prim. Trav. Sta. No. 26, 1915"	32 33 38.30	96 30 58.41	3,431
T. b. m. No. 25, at edge of lowland and open ground; in root of small ash tree blazed, scribed, and painted black "U. S. B. M. 25," nail	32 34 08.39	96 31 16.39	3,409
Dallas and Kaufman county line, marked by a Bois d'Arc post 8 inches square and 30 inches above ground; post is milepost 28 and is 2 miles north of county corner	32 34 22.35	96 31 20.80	1,461
P. b. m. No. 27, on C. W. Hain's land, on west side of lane leading to wooden bottom land, about 700 feet north of edge of timber and 1 foot from fence line; iron bench-mark post stamped "Prim. Trav. Sta. No. 27, 1915"	32 34 29.79	96 31 34.39	1,386
T. b. m. No. 31, about 400 feet S. 70° west from Mr. Tyler's house; in root of oak tree blazed, scribed, and painted black, "U. S. B. M. 31," nail	32 34 57.85	96 31 48.16	3,071
T. b. m. No. 32, near edge of woods and about 30 feet northwest of wire fence; in root of large pecan tree blazed, scribed, and painted black, "U. S. B. M. 32," nail	32 35 19.87	96 32 08.82	2,843
T. b. m. No. 33, 150 feet north of woods, in open field, in root of large pecan tree blazed, scribed, and painted black, "U. S. B. M. 33," nail	32 35 23.49	96 32 39.25	2,629
P. b. m. No. 28, on road to slough falls crossing, on east side of road, about 60 feet N. 30° W. from Mr. Finley's house, 4 feet from fence line, and at approximately high-water mark of 1908; iron bench-mark post stamped "Prim. Trav. Sta. No. 28, 1915"	32 35 40.57	96 32 58.60	2,392
T. b. m. No. 34, 350 feet east of levee, north 35° east, 65 feet from house in open field; in root of hackberry tree blazed, scribed, and painted black, "U. S. B. M. No. 34," nail	32 36 08.21	96 32 51.55	2,857
T. b. m. No. 35, at edge of lowland in lane running northeast and southwest; in root of pecan tree blazed, scribed, and painted black, "U. S. B. M. 35," nail	32 36 33.01	96 32 45.71	2,555
P. b. m. No. 29, about 1 mile east of Parsons Slough Bridge, on the Seagoville-Ferris Road, 150 feet east of levee, 7 feet west of wire fence, on high ground several feet above high-water mark rising to east; iron bench-mark post stamped "Prim. Trav. Sta. No. 29, 1905"	32 36 57.06	96 32 40.08	2,479
P. b. m. No. 30, on the Seagoville-Ferris road, 67 feet north from corner of wagon bridge across Parsons Slough, on top of levee, at gateway 20 feet east of center of road; iron bench mark post stamped "Prim. Trav. Sta. No. 30, 1915"	32 37 05.96	96 33 35.72	4,844

DALLAS QUADRANGLE—Continued.

Across river bottom to point east of Malloy Bridge.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. b. m. No. 36, about 0.70 mile southwest of Parsons Slough bridge, 50 feet northeast of center of road; in root of hackberry tree blazed, scribed, and painted black, nail	32 36 39.97	96 34 02.01	3,458
P. b. m. No. 31, 1 mile east of Malloy Bridge, 210 west of slough bridge on north side of road, 25 feet north of road, 4 feet from wire fence; iron bench-mark post stamped "Prim. Trav. Sta. No. 31"	32 36 16.92	96 34 29.27	3,295
P. b. m. No. 32, 132 feet east of pier at east end of Malloy Bridge across Trinity River, on grade landing up to bridge and in line with driveway across bridge; iron bench-mark post stamped "Prim. Trav. Sta. No. 32, 1915"	32 35 50.13	96 35 13.10	4,626

From Crabtree Ferry east across river bottom to point east of Parsons Slough Bridge.

Crabtree Ferry, 100 feet from, 20 feet south of road, close to telephone pole on small levee, river road makes straight angle turn near bench mark; concrete monument with 15-inch iron post set in it, no number on elevation (Corps of Engineers b. m.)	32 33 12.40	96 32 59.34	.....
Crabtree Ferry, 962 feet from above-described bench mark at; 15-inch iron post in concrete monument on top of small levee, no number or elevation (U. S. C. E. M.)	32 33 04.22	96 32 53.59	962
Station 103, U. S. Engineer Corps Station 101 (1912)	32 33 12.89	96 32 59.63	.....
T. b. m. No. 15, about 1,200 feet southeast from Crabtree Ferry, near negro cabin on north side of road; in root of spotted-oak tree blazed, scribed, and painted black, "U. S. B. M. 15, nail	32 33 10.90	96 32 44.64	1,299
T. b. m. No. 16, 6 feet north of wire fence along road, in root of ash tree blazed, scribed, and painted black, "U. S. B. M. 16," nail	32 33 10.35	96 32 14.55	2,577
T. b. m. No. 17, near right angle in road, 6 feet north of wire fence line; in root of elm tree blazed, scribed, and painted black, "U. S. B. M. 17," nail	32 33 16.97	96 32 07.81	883
T. b. m. No. 18, about 0.75 mile west of bridge over Parsons Slough, about middle of east and west road line; in root of ash tree blazed, scribed, and painted black, "U. S. B. M. 18," nail	32 33 16.78	96 31 38.66	2,495
T. b. m. No. 26, about 400 feet south of bridge over Parsons Slough; in root of large oak tree on east side of road blazed, scribed, and painted black, "U. S. B. M. 26," nail	32 33 22.28	96 31 17.90	1,862

Northwest up Bois d'Arc Island to Malloy Bridge road.

T. b. m. No. 27, in open field; at base of large pecan tree blazed, scribed, and painted black, "U. S. B. M. 27," nail	32 33 40.70	96 32 00.10	.....
T. b. m. No. 28, in woods; at base of ash tree blazed, scribed, and painted black, "U. S. B. M. 28," nail	32 34 01.75	96 32 23.02	2,893
T. b. m. No. 29, in north and south wire fence line, cleared ground to west, brush and timber to south and east; in root of hackberry tree blazed, scribed, and painted black, "U. S. B. M. 29," nail	32 34 18.47	96 32 47.08	2,665
T. b. m. No. 35, about 1.5 miles east of lock No. 4, about 750 feet north of negro cabin, at north end of clearing, close to fence corner north, east, and west, neighborhood road northeast crossing of slough; iron bench-mark post stamped "Prim. Trav. Sta. No. 35, 1915"	32 34 44.64	96 33 03.65	3,002
T. b. m. No. 30, 18 feet north of east and west farm roadway and fence line, woods north, south, and west; in root of large pecan tree blazed, scribed, and painted black, "U. S. B. M. 30," nail	32 34 52.77	96 33 34.42	2,759
T. b. m. No. 39, at edge of small strip of timber, with cleared land on south; in root of persimmon tree blazed, scribed, and painted black, "U. S. B. M. 39," nail	32 35 10.26	96 33 44.87	1,982
Iron bench-mark post No. 36	32 35 16.99	96 33 42.40	712
T. b. m. No. 38, in thick woods, at base of large dead ash tree blazed, scribed, and painted black, "U. S. B. M. 38," nail	32 35 39.79	96 33 47.93	2,352
T. b. m. No. 37, in thick woods; at base of ash tree, blazed, scribed, and painted black, "U. S. B. M. 37," nail	32 35 55.74	96 34 11.68	2,594

From Hurley's store to Wilmer Bridge.

T. b. m. No. 40, on west side of small slough and east side of cultivated field; in root of cottonwood tree blazed, scribed, and painted black, "U. S. B. M. 40,"	32 35 46.53	96 36 26.76	.....
T. b. m. 41, about 1 mile above Hurley's store, 100 feet west of road across Gravel Slough, in root of hackberry tree in fence line, line; tree is blazed, scribed, and painted black, "U. S. B. M. 41," nail	32 36 01.78	96 36 50.27	2,532

DALLAS QUADRANGLE—Continued.

From Hurley's store to Wilmer Bridge—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. b. m. No. 42, 6 feet north of east end of small bridge across gravel slough; in root of hackberry tree blazed, scribed, and painted black, "U. S. B. M. 42," nail	32 35 53.00	96 37 19.89	2,685
T. b. m. No. 43, in open field with scattering pecan trees; in root of large pecan tree blazed, scribed, and painted black, "U. S. B. M. 43," nail	32 35 56.38	96 37 46.36	2,291
T. b. m. No. 44, 75 feet southeast of right angle turn in road in lane bearing south 40° east; in root of pecan tree blazed, scribed, and painted black, "U. S. B. M. 44," nail	32 36 13.35	96 38 08.42	2,550
P. b. m. No. 33, about 1.5 miles southwest from river bridge, 70 feet northwest from small bridge, on north side of Wilmer-Lock No. 2 road; iron bench-mark post stamped "Prim. Trav. Sta. No. 33, 1915"	32 36 17.86	96 38 55.80	4,079
T road north, at center of Wilmer road, at southwest corner of woods	32 36 38.40	96 38 04.58	4,849
P. b. m. No. 34, about 700 feet west of west approach to Wilmer Bridge, 3 feet southwest of corner fence post at southeast corner junction of roads; iron bench-mark post stamped "Prim. Trav. Sta. 34, 1915"	32 36 55.04	96 37 26.90	3,636
T. b. m. No. 46, 30 feet south of southeast corner of woods; in center of road, in top of Bois d'Arc stump, nail	32 36 26.25	96 37 08.72	3,300
T. b. m. No. 47, 50 feet west of river bank, 60 feet southeast of concrete well, 150 feet southeast of cabin; in root of pecan tree, nail	32 36 34.72	96 36 22.53	4,042
T. b. m. No. 48, 50 feet west of southwest corner of clearing and 15 feet southwest of old tramway trestle; in root of Bois d'Arc tree, nail	32 36 19.60	96 35 57.18	2,651
T. b. m. No. 49, open field to south, in wire fence line; in root of hackberry tree, nail	32 36 06.18	96 35 37.06	2,193

Magnetic declination for district, 9° 08′ east.

Mineola and Willspoint quadrangles.

SMITH AND WOOD COUNTIES.

The following geographic positions on approximate North American datum were determined by primary traverse in February, 1915, by E. L. McNair. The line starts at crossing of Texas & Pacific Railway and Cotton Belt Route at Big Sandy, previously located by primary traverse described on page 219, Bulletin 310, and was double chained along Texas & Pacific Railway to Mineola. From Mineola several small circuits were run in the Sabine River bottom lands.

MINEOLA QUADRANGLE.

Along Texas & Pacific Railway from Big Sandy to Mineola (double chained).

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Big Sandy, crossing of Texas & Pacific Ry. and Cotton Belt Route	32 34 53.28	95 06 32.38	.....
Road crossing under Texas & Pacific Ry., 820 feet east of milepost 114, at bridge 114 B	32 34 56.86	95 07 32.76	5,180
Milepost 115, 860 feet east of, 39 feet south of center of track, 30 feet west of gate leading to land south, 300 feet to a cabin; iron post stamped "Prim. Trav. Sta. No. 1, 1915"	32 35 00.13	95 08 35.87	5,409
Upshur-Wood county line, center of track opposite post	32 35 02.49	95 09 12.27	3,124
Second-class road crossing, at Farmers Spur, 110 feet west of head block	32 35 05.35	95 10 02.46	4,305
Public road crossing	32 35 07.75	95 10 44.96	3,646
Hawkins station, 1,160 feet east of, 200 feet east of road under railway, 37 feet north of center of track, 18 inches south of right of way fence, 8 feet south of telephone pole; iron post stamped "Prim. Trav. Sta. No. 2, 1915"	32 35 12.71	95 12 05.95	6,948

MINEOLA QUADRANGLE—Continued.

Along Texas & Pacific Railway from Big Sandy to Mineola (double chained)—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Milepost 119, center of track opposite	32 35 14.74	95 12 48.29	3,629
Milepost 120, 500 feet east of, center of short trestle	32 35 18.15	95 13 48.83	5,191
Milepost 121, 215 feet east of, 43 feet north of center of track, 2 feet south of right of way fence; iron post stamped "Prim. Trav. Sta. No. 3, 1915"	32 35 29.67	95 14 49.24	5,298
Bryan siding, 0.9 mile southeast of, center of track, opposite water tank	32 35 41.91	95 15 22.62	3,118
Bryan siding, head block at west end of	32 36 01.28	95 16 13.52	4,774
Milepost 123, center of track opposite	32 36 12.57	95 16 43.15	2,780
Fouke Lumber Co.'s spur, 620 feet east of headblock at, nearly opposite small station platform 43 feet south of center of track, at right-of-way fence, 80 feet west of private road crossing; iron post stamped "Prim. Trav. Sta. No. 4, 1915"	32 36 37.65	95 17 50.16	6,268
Crow station, public road crossing at	32 26 56.63	95 18 51.62	5,596
Lake Fork siding, at east end of, switchstand	32 37 22.42	95 19 53.53	5,902
Lake Fork siding, 0.6 mile northwest of, 75 feet east of milepost 127, 40 feet south of track, on low ground, 1 foot north of right of way fence; iron post stamped "Prim. Trav. Sta. No. 5, 1915"	32 37 34.44	95 20 26.17	3,046
Milepost 128, center of track opposite, at west end of long trestle across Lake Fork	32 27 49.33	95 21 29.10	5,588
Lake Fork trestle, about 1.2 miles northwest of road crossing	32 38 06.58	95 22 36.11	5,990
Hoard siding, 1,100 feet west of road crossing at, 120 feet west of switch stand at west end of siding, 38 feet south of center of track, 1 foot north of right-of-way fence, near milepost 130; iron post stamped "Prim. Trav. Sta. No. 6, 1915"	32 38 21.80	95 23 23.08	4,301
Milepost 130, 1.75 miles northwest of, road crossing	32 38 51.70	95 25 04.94	9,219
Harts spur, 325 feet west of road crossing, 115 feet west of milepost 133, 50 feet south of main track, 1 foot north of right-of-way fence; iron post stamped "Prim. Trav. Sta. No. 7, 1915"	32 39 03.58	95 26 23.66	6,838
Harts spur, 1.5 miles northwest of; road crossing	32 29 23.72	95 27 52.02	7,824
Mineola station, 1,250 feet east of, 45 feet north of center of track, on bank 18 inches south of right-of-way fence; iron post stamped "Prim. Trav. Sta. No. 8, 1915"	32 39 41.18	95 29 07.52	6,692
Mineola station, 200 feet west of, street crossing	32 29 44.46	95 29 24.09	1,456

WILLSPOINT QUADRANGLE.

Near Mineola.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Mineola, crossing of Texas & Pacific and Missouri, Kansas & Texas railways	32 39 55.32	95 30 12.35	4,270
Farm crossing, 1,060 feet east of milepost 138	32 40 08.56	95 31 11.13	5,200
Macks siding, 190 feet southeast of switchstand at east end of, road crossing under track	32 40 18.45	95 31 55.09	3,890
Macks siding, 110 feet west of switchstand at, 20 feet east of milepost 139, 47 feet south of center of track, 18 inches north of right of-way fence; iron post stamped "Prim. Trav. Sta. No. 9, 1915"	32 40 23.61	95 32 20.07	2,198
Macks siding, about 0.8 mile northwest of; center of track at trestle over creek	32 40 34.35	95 33 05.44	4,027
Sabine River, west end of bridge over, opposite post between Smith and Wood counties; center of track at	32 40 14.33	95 34 05.78	5,540
Milepost 141, 105 feet east of, 870 feet west of Smith and Wood county line post, 45 feet south of track, 23 feet west of fence line southeast; iron post stamped "Prim. Trav. Sta. No. 10, 1915"	32 40 10.64	95 34 14.92	866
On south side of Sabine River, in bottom lands.			
Sabine River, about 0.50 mile south of Texas & Pacific Ry. bridge over; in root of leaning oak tree, blazed, scribed, and painted black, "T. B. M. No. 1," nail	32 39 47.61	95 34 19.87	2,367
Sabine River Bridge, about 1 mile south of, 75 feet west of a creek, on a little higher ground than apparent high water; in root of sweet-gum tree, blazed, scribed, and painted black, "U. S. B. M. No. 2," nail	32 39 39.10	95 34 44.55	2,278
Sabine River Bridge, about 0.60 mile south of; nail in root of water oak, blazed, scribed, and painted "U. S. B. M. No. 3"	32 39 40.35	95 34 16.67	2,387
Sabine River Bridge, about 0.80 mile southeast of, 500 feet south of river, 100 feet east of creek; in root of a post-oak tree, blazed, scribed, and painted black, "U. S. B. M. No. 4," nail	32 39 48.15	95 33 50.16	2,398

WILLSPOINT QUADRANGLE—Continued.

Mineola district.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. b. m. No. 5, 300 feet south of creek, near edge of lowland, in root of post-oak tree, blazed, and painted black, "U. S. T. B. M. No. 5," nail	32 39 37.42	95 33 49.94	1,084
T. b. m. No. 6, 80 feet east of a lake; in root of post-oak tree 30 inches in diameter, blazed, and painted, "U. S. T. B. M. No. 6," nail	32 39 31.39	95 33 22.70	2,406
T. b. m. No. 7, 300 feet south of the Callaway Crossing Road; in root of pin-oak tree, about 18 inches in diameter; nail	32 39 06.67	95 33 15.39	2,575
Permanent bench mark	32 38 59.55	95 32 50.80	2,223
T. b. m. No. 8, 300 feet south of bridge over slough, on east side of Callaway Crossing Road, near edge of overflow; in root of water-oak tree 18 inches in diameter, blazed, scribed, and painted "U. S. B. M. No. 8"	32 38 25.68	95 33 11.56	3,856
T. b. No. 9, in woods in flat ground, in root of water-oak tree 20 inches in diameter, blazed, scribed, and painted black "U. S. B. M. No. 9," nail	32 38 04.60	95 32 59.08	2,383
T. b. m. No. 10, 100 feet north of rising ground, in root of post-oak tree, about 18 inches in diameter, blazed, scribed, and painted black "U. S. B. M. No. 10;" nail	32 37 44.27	95 32 40.44	2,600
T. b. m. No. 11, in root of water oak, blazed, scribed, and painted black, "U. S. B. M. No. 11;" nail	32 37 32.96	95 32 10.80	2,782
T. b. m. No. 13, in root of oak tree, blazed but not painted; nail	32 36 59.59	95 31 31.62	4,754
Burleson Lake, 0.25 mile southeast of outlet of, about 125 feet south of old ford probably dry at low water, on bank among scrub timber and brush; iron bench-mark post stamped "Prim. Trav. Sta. No. 11, 1915." Reference marks: A 6-inch post-oak tree S. 62° E., distant 17 feet, and an 8-inch red-oak tree, south 10° east, distant 28 feet; both trees blazed and marked with three hacks	32 36 53.36	95 31 16.75	1,420
T. b. m. No. 14, 250 feet west of cotton field, 200 feet south of slough, in root of elm tree in wire-fence line; tree is blazed, scribed, and painted black, U. S. B. M. No. 14," nail	32 36 56.88	95 30 55.66	1,839
T. b. m. No. 15, 75 feet north of a roadway, 50 feet west of west edge of an open field; in root of gum tree blazed, scribed, and painted black, "U. S. B. M. No. 15," nail	32 36 47.09	95 30 29.26	2,466
T. b. m. No. 16, 50 feet northwest of bottom road, in root of pin oak blazed, scribed, and painted black, "U. S. B. M. No. 16," nail	32 36 46.85	95 30 06.37	1,957

MINEOLA QUADRANGLE.

Mineola district.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
P. b. m. No. 12, beside wire fence north of cotton field at approximate right angle in old road, N. 25° E., distant 30 feet to oak tree, and S. 85° W., distant 32 feet to oak tree, south 29° west, 38 feet to oak tree; all blazed and marked with three hacks; iron bench-mark post stamped "Prim. Trav. Sta. No. 12, 1915"	32 36 43.61	95 29 51.13	1,345
T. b. m. No. 17, in root of 8-inch elm tree nearly in middle of bottom road, about 0.50 mile west of south end of "Dump Road"; tree is blazed, scribed, and painted black, "U. S. B. M. No. 17," nail	32 36 44.44	95 29 21.76	2,513
T. b. m. No. 18, in root of gum tree, about 80 feet east of bridge over slough at south end of "Dump Road," the road leading south from Mineola across the Sabine River bottom; tree is blazed, scribed, and painted black, "U. S. B. M. No. 18," nail	32 36 42.46	95 29 07.61	1,225
T. b. m. No. 19, 150 feet north of high-water mark, open field on south, 35 feet east of wire fence; in root of "over cup" oak tree, blazed, scribed, and painted, "U. S. B. M. No. 19," nail	32 36 21.29	95 28 55.36	2,383
P. b. m. No. 13, 500 east of creek, 150 feet north of knoll 20 feet high, in forest, S. 52° E., distant 15 feet to oak, S. 60° W., distant 25 feet to oak, N. 48° W., distant 30 feet to gum tree; iron bench-mark post stamped "Prim. Trav. Sta. No. 13, 1915." All trees marked with three hacks	32 36 10.25	95 28 25.74	2,770
T. b. m. No. 20, 50 feet north of wire fence at edge of swamp, cotton field on south; tree blazed, scribed, and painted black, "U. S. B. M. No. 20," nail in root of pin-oak tree	32 36 16.83	95 28 00.19	2,285
T. b. m. No. 21, in root of pecan tree, 8 feet north of fence close to small creek; tree blazed, scribed, and painted black, "U. S. B. M. No. 21," nail	32 36 18.10	95 27 25.87	2,938

MINEOLA QUADRANGLE—Continued.

Along International & Great Northern Railway to Mineola.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
P. b. m. No. 14, 76 feet east of center of track at Eads flag station, on the International & Great Northern Ry.. 15 inches west of wire fence line, 40 feet southeast of corner of cabin, and approximately 200 feet from south end of railroad bridge across Sabine River; iron bench-mark post stamped "Prim. Trav. Sta. No. 14, 1915"	32 36 20.74	95 26 53.63	2,770
Eads flag station, about 0.30 mile northwest of; north end of long trestle	32 36 36.31	95 27 05.00	1,849
Eads flag station, about 1.30 miles northwest of; switch stand at spur to sawmill	32 37 13.70	95 27 29.82	4,337
Milepost No. 42, 320 feet northwest of; road crossing	32 38 15.18	95 28 13.08	7,231
Milepost No. 43, about 0.25 mile southeast of; private road crossing	32 38 44.12	95 28 40.34	3,742
Mineola, about 0.75 mile southeast of; switch stand at north end of Y	32 39 17.91	95 28 50.78	3,530

From International & Great Northern Railway up north side of Sabine River.

International & Great Northern milepost No. 42, 2,200 feet southeast of, 37 feet west of center of track, 15 feet east of right of way fence, about 150 feet north of edge of river bottom; iron bench-mark post stamped "Prim. Trav. Sta. No. 15, 1915"	32 37 54.32	95 27 57.30	.....
T. b. m. No. 22, about 100 feet north of brush and timber line, at edge of lowland, in open field; in root of walnut tree, blazed, scribed, and painted black, "U. S. B. M. No. 22," nail	32 38 08.85	95 28 28.68	3,059
T. b. m. No. 23, about 0.50 mile below "Dump Road," 1,000 feet northwest of edge of timber line, near wire-fence line; in base of post-oak tree top broken off; tree is blazed, scribed, and painted black, "U. S. B. M. No. 23," nail	32 38 00.22	95 28 46.34	1,744
P. b. m. No. 16, on Mineola-Tyler road, at north edge of Sabine River bottom, in line with "Dump Road" going south, 70 feet southwest to center of road and 2 feet south of wire fence; iron bench-mark post stamped "Prim. Trav. Sta. No. 16, 1915"	32 37 52.33	95 29 03.13	1,640
T. b. m. No. 26, 40 feet south of fence at edge of field, in root of leaning post-oak tree, 24 inches in diameter; tree is blazed, scribed, and painted black, "U. S. B. M. No. 26," nail	32 37 50.38	95 29 27.93	2,130
T. b. m. No. 27, in open field, with few scattering trees near by; in root of 30-inch pin-oak tree, blazed, scribed, and painted black, "U. S. B. M. No. 27"	32 37 54.22	95 29 58.61	2,653

WILLSPOINT QUADRANGLE.

Up north side of Sabine River.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
P. b. m. No. 17, 150 feet north of level bottom land, at south end of north and south land or private road, 2 feet south of east and west fence line and 3 feet west of corner fence post; iron bench-mark post stamped "Prim. Trav. Sta. No. 17, 1915"	32 38 09.23	95 30 25.89	2,782
T. b. m. No. 28, at edge of woods and overflowed land; in root of gum tree, blazed, scribed, and painted black, "U. S. B. M. No. 28," nail	32 38 15.05	95 30 55.51	2,602
T. b. m. No. 29, at edge of timber line and overflowed ground, 6 feet south of east and west wire fence, south of cotton field; in root of elm tree, blazed, scribed, and painted black, "U. S. B. M. No. 29," nail	32 38 41.63	95 31 05.57	2,821
T. b. m. No. 30, at edge of timber and lowland, 15 feet south of east and west wire fence; nail in root of post-oak tree blazed, scribed, and painted black, "U. S. B. M. No. 30"	32 38 56.03	95 31 29.74	2,528
T. b. m. No. 31, about 1,000 feet east of Callaway Road, in woods; in root of oak tree blazed, scribed, and painted black, "U. S. B. M. No. 31," nail	32 39 01.06	95 32 09.16	3,409
P. b. m. No. 18, on Callaway Crossing Road, 50 feet northeast of end of bridge over slough, at foot of hill on north side of bottom, 2 feet from wire fence on north side of road; iron bench-mark post stamped "Prim. Trav. Sta. No. 18, 1915"	32 39 08.79	95 32 13.80	875
T. b. m. No. 32, in lowland, field on east; in root of elm tree, blazed, scribed, and painted black, "U. S. B. M. No. 32," nail	32 39 36.90	95 32 21.09	2,909

WILLSPOINT QUADRANGLE—Continued.

Up north side of Sabine River—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
T. b. m. No. 33, 150 feet east of slough, 10 feet north of wire fence north and west of open field; in root of elm tree blazed, scribed, and painted, "U. S. B. M. No. 33," nail	32 40 01.55	95 32 38.89	2,921
T. b. m. No. 34, in forest and overflowed land; in root of pin-oak tree, blazed, scribed, and painted black, "U. S. B. M. No. 34," nail	32 40 14.53	95 33 00.03	2,232
P. b. m. No. 20, 1,500 feet southeast of Texas & Pacific Ry. bridge over Butler Lake, on east side of Sabine River bottom, about 450 feet east along fence from Butler Lake, 3 feet south of east and west wire fence, 5 feet from braced fence post in angle at fence line; iron bench-mark post stamped "Prim. Trav. Sta. No. 20, 1915"	32 40 11.84	95 33 27.61	2,373
T. b. m. No. 35, 300 feet east of Silver Lake, 55 feet south of track, in edge of timber; in root of pin-oak tree blazed, scribed, and painted black, "U. S. B. M. No. 35," nail	32 40 23.20	95 33 48.03	2,088

Across Sabine River bottom along Dump road.

T. b. m. No. 24, 20 feet east of public road; in root of post-oak tree, blazed, scribed, and painted black, "U. S. B. M. No. 24," nail	32 37 22.51	95 29 03.57	.....
T. b. m. No. 25, 30 feet west of center of road; in root of locust tree blazed, scribed, and painted black, "U. S. B. M. No. 25," nail	32 36 58.78	95 29 05.86	2,400

Cross line near Callaway Bridge.

Sabine River, center of bridge over, at concrete pier at west end	32 39 00.54	95 32 38.92	.....
Sabine River Bridge, 1,000 feet west of, 100 feet south of end of small pond, S. 4° 30′ W., distant 45 feet to post-oak tree, north 85° east, distant 32 feet to post-oak tree, N. 33° E., distant 26 feet to post-oak tree; all blazed and marked with 3 hacks; iron bench-mark post stamped "Prim. Trav. Sta. No. 19, 1915"	32 38 59.56	95 32 50.81	1,018

Magnetic declination 8° 7′ E.

Addicks, Aldine, Alief, Almeda, Ashford, Bellaire, Burnett Bay, Cedar Bayou, Clodine, Crosby, Cypress, Deepwater, Fauna, Harmaston, Hillendahl, Hockley, Holik, Houston Heights, Huffman, Humble, Katy, La Porte, Louetta, Morgans Point, Mykawa, New Caney, Park Place, Pauli, Rosehill, Scott Ranch, Seabrook, Settegast, Spring, Stuebner, Sugarland, Swanson, Waller, Walley, Webster, and Weedon 7½′ quadrangles.

BRAZORIA, FORT BEND, GALVESTON, HARRIS, AND LIBERTY COUNTIES.

The following geographic positions on North American datum were determined by E. L. McNair in 1915. They are based on positions of stations Thayer, Tory Hill, and Morgans Point of the United States Corps of Engineers as given in Coast and Geodetic Survey Special Publication 17. Starting from these stations in the southeast part of Harris County, lines were run in circuits mostly following public roads and extending over all of Harris County, with a few positions extending over into the adjoining counties mentioned. In all 708 miles of traverse were run and 216 permanent bench marks were established. In addition 22 permanent marks of Coast and Geodetic Survey and United States Corps of Engineers were located.

The elevations were determined by primary leveling and accord with the 1912 adjustment. The leveling was done by R. R. Monbeck in 1915 and by D. S. Birkett in 1916. The work was done in cooperation with Harris County.

ADDICKS QUADRANGLE.

Along highways near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Addicks station (Missouri, Kansas & Texas Ry.), 200 feet east of, 100 feet south and 25 feet east of public-road crossing, on line of right of way, 2 feet northeast of corner fence post; iron post with 3-inch cap. Coast and Geodetic Survey bench-mark C8; "Prim. Trav. Sta. No. 72, 1915," (not stamped), elevation 96.332 feet	29 47 04.78	95 38 29.49	
Private road crossing, top of rail; elevation 90.4 feet			
Addicks, 0.8 mile east of, 35 feet north of public road; copper nail in root of lone oak tree, painted "U. S. B. M. 153," elevation 82.19 feet	29 47 06.64	95 37 40.09	4,356
Addicks, 1 mile east of, on northwest corner of 200-foot wagon bridge over creek, floor of bridge; elevation 88.62 feet			
Addicks, 0.8 mile north of, 480 feet north of bridge, 120 feet south of another bridge across creek, 10 feet east of road; copper nail in root of oak tree painted "U. S. B. M. 164," elevation 90.23 feet	29 47 45.78	95 38 42.02	
Addicks, 1.75 miles north of, 1,200 feet south of German Methodist Church, 30 feet east of road, 6 inches from corner post on fence east; copper nail in hub, post painted "U. S. B. M. 165," elevation 98.13 feet	29 48 35.47	95 38 41.73	5,020
Addicks, 2.3 miles north of, 2,000 feet north of German Methodist Church, 30 feet west of center of road, 3 feet from corner post on fence line west; iron post stamped "Prim. Trav. Sta. No. 74, 1915," elevation 104.707 feet	29 49 06.34	95 38 43.58	3,124
Addicks, 3.15 miles north of, 30 feet south and 25 feet east of T road west, 4 feet from corner fence post at fence line east, 8 inches from telephone pole; copper nail in hub, pole painted "U. S. B. M. 166," elevation 106.96 feet	29 49 48.72	95 38 43.38	4,281
Addicks, 4 miles north of, 25 feet east of center of road, 6 inches from telephone pole painted "U. S. B. M. 167"; copper nail in hub, elevation 115.28 feet	29 50 35.02	95 38 43.85	4,677
Addicks, 4.6 miles north of; T road south	29 51 06.42	95 38 44.48	3,173
Addicks, 4.6 miles north and 0.4 mile east of, about 150 feet south and 200 feet east of Grigsby schoolhouse, 4 feet from corner fence post; iron post stamped "Prim. Trav. Sta. 75, 1915," elevation 119.170 feet	29 51 06.75	95 38 23.64	1,835
Grigsby schoolhouse, about 0.6 miles northeast of, 800 feet north of small bridge at bend of road, 20 feet west of center of road; in root of oak tree painted "U. S. B. M. 168"; copper nail, elevation 109.67 feet	29 51 30.81	95 37 57.96	3,318
Grigsby schoolhouse, 0.5 mile east and 1.4 mile north of, 25 feet east of center of road, 6 inches from telephone pole, at corner of fence and lane east; t. b. m. 169; copper nail in hub, elevation 124.23 feet	29 52 18.11	95 37 57.78	4,779

Along highways north and west in south-central part of quadrangle.

Barker, 2 miles south of, 220 feet south of bridge over Buffalo Bayou, 60 feet west of road; copper nail in root of oak tree painted "U. S. B. M. 91," elevation 85.94 feet	29 45 19.35	95 41 05.82	
Barker, 1 mile south of, 25 feet east of center of road, 1 foot from corner post on fence line east at south end of gate; copper nail in hub, post painted "U. S. B. M. 92," elevation 90.11 feet	29 46 11.62	95 41 06.73	5,280
Barker, 20 feet east of station on Missouri, Kansas & Texas Ry., 115 feet south of center of track, 35 feet west by 25 feet south of T road south, at corner post of fence; iron post primary traverse station No. 43 (not stamped) U. S. Coast and Geodetic Survey bench-mark B8, elevation 105.476 feet	29 47 05.49	95 41 07.90	5,443
Barker, 0.8 mile west of, 250 feet southeast of "Yard Limit" signboard, about 30 feet south of center of road and about 125 feet south of Missouri, Kansas & Texas Ry., 2 feet north of telephone pole, copper nail in hub, pole painted "U. S. B. M. 93," elevation 111.15 feet	29 47 05.71	95 41 59.80	4,575
Barker, 1.7 miles west of, 900 feet east of road crossing, 20 feet north of center of public road, about 60 feet south of Missouri, Kansas & Texas Ry., 1 foot from telephone pole; copper nail in hub, pole painted "U. S. B. M. 94," elevation 115.88 feet	29 47 06.48	95 42 55.04	4,870
Road crossing; top of rail 119.0 feet			

ADDICKS QUADRANGLE—Continued.

Along highway north and west in south-central part of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Barker, 2.5 miles west of, 980 feet east of switch stand, about 60 feet south of Missouri, Kansas & Texas Ry. track, 20 feet north of center of road, 1.5 feet south of wire fence line, 4 feet east of telephone pole; iron post stamped "Prim. Trav. Sta. No. 44, 1915," elevation 124.051 feet	29 47 06.75	95 43 40.05	3,968
Katy, 4.6 miles east of, 115 feet south of Missouri, Kansas & Texas Ry. track, at a point 50 feet west of Delhi flag station, 30 feet south of public road, 2 feet north of corner post on fence line south; a stone post 6 inches square lettered "U. S. B. M." with 0.5-inch deep hole in center. United States Coast and Geodetic Survey bench mark A8, primary traverse station No. 45 (not marked); elevation, 124.816 feet	29 47 06.44	95 44 39.49	5,240
East along highways to Addicks.			
Barker, 4,500 feet east of, 25 feet south of center of public road, 6 inches from telephone pole; copper nail in hub, pole painted "U. S. B. M. 151," elevation, 99.04 feet	29 47 05.21	95 40 16.84	.....
Barker, 1.7 miles east of, 30 feet north of center of road, 50 feet south of Missouri, Kansas & Texas Ry. track, 6 inches from telephone pole; copper nail in hub, pole painted "U. S. B. M. 152," elevation, 97.33 feet	29 47 05.48	95 39 25.68	4,508
Near northwest corner of quadrangle.			
Cypress, 6.8 miles south by 1.9 miles west of, 6 feet south of northwest corner of fence around house; copper nail in hub, fence painted "U. S. B. M. 123," elevation, 140.82 feet	29 52 12.52	95 43 43.05	.....
Katy, 5.4 miles north by 4.6 miles east of, about 0.8 miles west of crossing of Bear Creek on east and west road, 35 feet north of road, 10 feet north of fence corner; iron post stamped "Prim. Trav. Sta. No. 59, 1915," elevation, 143.839 feet	29 51 53.33	95 44 43.03	5,629
Along highways near north border of quadrangle.			
Brink schoolhouse, 0.2 mile south and 1.8 miles west of, 15 feet south of road; copper nail in hub, witness stake painted "U. S. B. M. 169" (should be 170), elevation, 137.21 feet	29 52 26.00	95 42 47.76	.....
Brink schoolhouse, 0.2 mile south and 0.9 mile west of, 20 feet north of center of road; copper nail in hub, witness stake painted "U. S. B. M. 170" (should be 171), elevation, 135.08 feet	29 52 26.72	95 41 53.24	4,800
Brink schoolhouse, 0.2 mile south and 750 feet west of, 30 feet northeast of corner of bridge over Langham Creek, 40 feet west of pine tree 3 feet in diameter; iron post stamped "Prim. Trav. Sta. No. 77, 1915," elevation, 128.303 feet	29 52 26.81	95 41 08.22	3,964

Magnetic declination in quadrangle, 8° 30′ E.

ALDINE QUADRANGLE.

Near southwest corner of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
West Montgomery road, forks of road, road north from	29 55 20.06	95 29 51.65	2,587
North Houston, 1.0 mile east of, 25 feet southwest of West Montgomery Road, at bend, 3 feet east of fence post at angle in fence line; iron post stamped "Prim. Trav. Sta. No. 133, 1915," elevation, 110.001 feet	29 55 11.04	95 29 40.09	1,367
North Houston, 1.5 miles south 60° east of, 30 feet east of road, fences south and east, 4 inches west of corner fence post painted "U. S. B. M. 296"; copper nail in hub, elevation, 106.47 feet	29 54 35.70	95 29 44.16	3,589

ALDINE QUADRANGLE—Continued.

Near southwest corner of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Fairbanks, 3.45 miles north and 1.7 miles east of, 30 feet east of center of road, at north end of gate, fences north, south, and east, 4 inches from corner fence post painted "U. S. B. M. 297"; copper nail in hub, elevation, 105.93 feet	29 53 49.86	95 29 43.59	4,632
Fairbanks, 2.9 miles north and 1.75 miles east of, 60 feet northeast of Trinity & Brazos Valley Ry., 170 feet north and 25 feet east of road crossing, 2½ feet east of corner post on right-of-way fence; iron post stamped "Prim. Trav. Sta. No. 134, 1915," elevation 97.873 feet	29 53 18.95	95 29 39.85	3,141
Fairbanks, 2.6 miles north and 1.75 miles east of, T road corners north, south, and east	29 53 03.82	95 29 39.62	1,530
Fairbanks, 2 miles north and 1.75 miles east of, 520 feet south of bridge, 30 feet east of center of road, ash tree painted "U. S. B. M. 298"; copper nail in root, elevation 87.25 feet	29 52 30.30	95 29 40.60	3,389

In north end of quadrangle along public road.

Cypress Creek Bridge on "air line" road, about 1.25 miles south and 0.9 mile east of, near south edge of woods, 30 feet northeast of road; oak tree painted "U. S. B. M. 271"; copper nail in root, elevation 121.04 feet	29 59 09.01	95 29 49.20	.....
Pemble's store, 3.4 miles southwest of, on Erhart Road, 3,000 feet S. 20° W. from crossroads, 35 feet northwest of center of road, in open prairie; iron post stamped "Prim. Trav. Sta. No. 132, 1915," elevation 117.915 feet	29 58 15.06	95 29 41.94	.....
Crossroads	29 58 43.40	95 29 29.93	3,052
Pemble's store, 1.9 miles southwest of, 25 feet southeast of road, oak tree painted "U. S. B. M. 272"; copper nail in hub, elevation 120.16 feet	29 59 26.50	95 29 12.24	4,625
Pemble's store, 1.4 miles southwest of, on Erhart road, 75 feet northeast of house of W. T. Krimmel, 20 feet southeast of road and 20 feet west of fence line; iron post stamped "Prim. Trav. Sta. No. 123, 1915," elevation 122.366 feet	29 59 45.20	95 28 59.02	2,220
Pemble's store, 0.9 mile southeast of, on Erhart road, 20 feet west of road at bend; iron post stamped "Prim. Trav. Sta. No. 124, 1915," elevation 112.919 feet	29 59 46.00	95 27 18.98	.....
Premble's store, 1.8 miles southeast of, 2.2 miles northwest of forks of E. Montgomery road, 120 feet south of gateway to small house, 25 feet west of road, 6 inches from fence corner, witness stake painted "U. S. B. M. 275"; copper nail in hub, elevation 105.48 feet	29 59 14.30	95 26 41.60	4,589
Aldine, 3.15 miles north and 3.1 miles west of, 1.25 miles north of forks of E. Montgomery road, 150 feet south of small house, 20 feet east of road, 6 inches from corner fence post painted "U. S. B. M. 276"; copper nail in hub, elevation 102.82 feet	29 58 40.38	95 26 01.97	4,888
Aldine, 2.3 miles north and 2.3 miles west of, 25 feet east of E. Montgomery road, opposite forks of road, 55 feet north of road going east in open prairie; iron post stamped "Prim. Trav. Sta. No. 125, 1915," elevation 100.508 feet	29 57 55.86	95 25 07.84	6,551
Aldine, 2.3 miles north and 1.5 miles west of, 1 mile west of International & Great Northern Ry., 135 feet north of road; gum tree, one of a group of five, painted "U. S. B. M. 277"; copper nail in root, elevation 101.38 feet	29 57 57.16	95 24 17.06	4,471

Along road close to railroad near east border of quadrangle.

Westfield, 2 miles south of, 30 feet west of center of road, 0.60 mile north of milepost 134, 1 foot east of right-of-way fence; copper nail in hub, post and witness stake painted "U. S. B. M. 238," elevation 101.18 feet	29 59 39.91	95 23 44.33	.....
Westfield, 2.70 miles south of, 650 feet south of milepost 134, 108 feet east of track, 25 feet east of center of road, 4 feet from corner fence post; iron post stamped "Prim. Trav. Sta. No. 107, 1915," elevation 102.747 feet	29 59 03.10	95 23 34.49	3,820
Road crossing, top of rail, elevation 103.5 feet	.....	.....	.....
Aldine, 2.65 miles north of, 1,800 feet north of a road crossing, 25 feet west of center of road, 4 feet east of right-of-way fence line, 15 feet east of telegraph pole; copper nail in hub, witness stake 3 feet west painted, pole painted "U. S. B. M. 239," elevation 97.217 feet	29 58 13.62	95 23 22.77	5,103
Aldine, 2.30 miles north of, public road crossing International & Great Northern Ry	29 57 56.21	95 23 19.06	1,789
500 feet southeast of two-story white house; top of rail, elevation 96.1 feet	.....	.....	.....

ALDINE QUADRANGLE—Continued.

Along road close to railroad near east border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Aldine, 1.75 miles north of, 40 feet east of center of railroad track, 45 feet west of public road, 1 foot east of telegraph pole, painted "U. S. B. M. 240," elevation 87.92 feet	29 57 26.07	95 23 11.08	3,126
International & Great Northern Ry. bridge 280, over Green's Bayou, top of rail, 87.4 feet			

Along road close to railroad near west border of quadrangle.

Aldine, 1.10 miles north of, 240 feet south of south end of highway bridge over Greens Bayou, 60 feet east of center of railroad track, 25 feet west of center of road, 8 feet east of telephone pole; iron post stamped "Prim. Trav. Sta. No. 108, 1915," elevation 82.465 feet	29 56 53.83	95 23 02.77	3,339
Aldine, 1,400 feet north of station, 25 feet west of center of road, 120 feet southwest of store, 1 foot from telegraph pole painted "U. S. B. M. 241"; copper nail in hub, elevation 81.595 feet	29 56 10.62	95 22 52.04	4,467
Aldine, 75 feet east of station, road crossing the International & Great Northern Ry.; top of rail, 85.7 feet	29 55 56.42	95 22 48.20	1,474
Aldine, about 0.75 mile south of, 30 feet west of center of road, 50 feet east of railroad track, about 50 feet north of steps over fence, 2 feet east of telephone pole painted "U. S. B. M. 242"; copper nail in hub, elevation 81.56 feet	29 55 18.79	95 22 39.05	3,887
Aldine, 1.20 miles south of, 55 feet east of center of track, 30 feet west of center of road, 300 feet south of small wooden bridge, 3 feet east of right-of-way fence line; iron post stamped "Prim. Trav. Sta. No. 109, 1915," elevation 81.122 feet	29 54 55.51	95 22 32.97	2,412

ALIEF QUADRANGLE.

Along Westheimer road.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Houston, 6.3 miles west of city limits, on Westheimer road, about 1 mile north and 0.5 mile east of Jeanetta, 25 feet south and 20 feet east of T road corner, 2.5 feet from corner fence post; iron post stamped "Prim. Trav. Sta. No. 9, 1915," elevation 72.583 feet	29 44 13.55	95 30 50.58	
T road corners, roads east, west, and north	29 44 13.52	95 31 15.54	2,200
Houston, 7.4 miles west of city limits, on Westheimer road, 25 feet north of center of road, on line of north and south fence, close to corner fence post; copper nail in hub; post painted "U. S. B. M. No. 17," elevation 74.53 feet	29 44 13.35	95 31 54.66	3,449
Houston, 8.3 miles west of city limits, on Westheimer road, 25 feet north of center of road, in line with fence line north, 1 foot from corner fence post; copper nail in hub, painted on post "U. S. B. M. No. 18," elevation 79.36 feet	29 44 12.56	95 32 52.99	5,142
Alief, 2 miles east and 1.5 mile north of, on Westheimer road, 25 feet south and 20 feet west of T road south, 2 feet from fence corner, about 350 feet north of large new house; iron post stamped "Prim. Trav. Sta. No. 10, 1915," elevation 81.030 feet	29 44 11.55	95 33 35.26	3,728
Alief, 2 miles east of, about 0.5 mile north of San Antonio & Aransas Pass Ry., 20 feet west of center of north and south road, 1 foot from corner fence post, at fence line west; post painted "U. S. B. M. No. 19"; copper nail in hub, elevation 80.48 feet	29 43 31.45	95 33 34.42	4,052
Alief, about 2.25 miles southeast of, 80 feet north of east and west road, north and south road crossing over San Antonio & Aransas Pass Ry	29 43 03 45	95 33 33.56	2,829
Alief, about 1.6 miles east of, 30 feet north of center of public road and about 60 feet south of San Antonio & Aransas Pass Ry., 1 foot from telephone pole painted "U. S. B. M. No. 20"; copper nail in hub, elevation 79.80 feet	29 43 00.92	95 33 58.88	2,247
Alief, about 1.1 miles east of, 30 feet south of center of public road, 100 feet south of San Antonio & Aransas Pass Ry., opposite railroad post marked "1 Mile to Station"; iron post stamped "Prim. Trav. Sta. No. 11, 1915," elevation 80.667	29 42 57.98	95 34 27.89	2,575
Brays Bayou, San Antonio & Aransas Pass Ry. bridge over; top of rail, elevation 83.5 feet			
Alief station, 50 feet south and 60 feet east of, 170 feet west of road north, across track, 1 foot north of telephone pole painted "U. S. B. M. No. 21"; copper nail in hub, elevation 79.53 feet	29 42 53.15	95 35 33.41	5,797

ALIEF QUADRANGLE—Continued.

Along Westheimer road—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Alief, 1 mile south of, opposite L. L. Holland's residence, 1 foot from gatepost at entrance to barnyard; copper nail in hub, "U. S. B. M. No. 22," elevation 82.09 feet	29 41 56.38	95 35 45.10	5,827
Alief, 1.75 miles south of, 25 feet west of center of north and south road, 2 feet from gatepost in wire fence line; iron post stamped "Prim. Trav. Sta. No. 12, 1915", elevation 82.533 feet	29 41 19.60	95 41 45.01	3,715
Alief, 2.6 miles south of, 25 feet south of east and west road, known as Richmond Road, 2 feet north of gatepost, painted "U. S. B. M. No. 23"; copper nail in hub, elevation 87.09 feet	29 40 32.39	95 35 44.05	4,770
Alief, 2.6 miles south by 0.8 mile east of floor of wooden culvert, elevation 86.4 feet			
Alief, 2.6 miles south by 1.1 miles east of, 25 feet north of center of road, 1,200 feet southwest from two-story white house; copper nail in hub, post painted "U. S. B. M. No. 24," elevation 83.95 feet	29 40 27.31	95 34 28.00	6,729
Alief, 2.6 miles south and 1.7 miles east of, on Richmond Road, on open prairie, no fences, N. 67° W., distant 0.5 mile to two-story white house with windmill and red barn, 1,200 feet east of small angle in road, 35 feet north of center of road; iron post stamped "Prim. Trav. Sta. No. 13, 1915," elevation 81.593 feet	29 40 26.91	95 33 53.06	3,082
Alief, 2.6 miles south by 2.4 miles east of, 55 feet north of east and west road; in root of lone tree on prairie; copper nail, tree painted "U. S. B. M. No. 25," elevation 75.05 feet	29 40 28.94	95 33 24.65	2,516
Alief, 2.6 miles south by 3.5 miles east of, 1 foot from fence post in front of one and one-half story house; copper nail in hub, post painted "U. S. B. M. No. 26," elevation 72.48 feet	29 40 32.79	95 32 15.87	6,080
Missouri City, about 4.2 miles north of, 60 feet east of road south, in line with road west; iron post stamped "Prim. Trav. Sta. No. 14, 1915," elevation 66.899 feet	29 40 34.27	95 31 40.80	3,098
Missouri City, 3 miles north and 0.6 mile east of, 35 feet east of center of north and south road, 6 inches from corner fence post at fence line east; copper nail in hub, post painted "U. S. B. M. No. 27," elevation 71.43 feet	29 39 46.15	95 31 40.26	4,861
Missouri City, 2.6 miles north of, 1.25 miles south of Richmond Road, 20 feet north and 25 feet east of right angle in road, 1 foot east of corner fence post painted "U. S. B. M. No. 25"; copper nail in hub, elevation 73.29 feet	29 39 21.82	95 32 10.52	3,628
Missouri City, about 1.7 miles north of, on south side of angle in road to southwest, 30 feet south of wooden bridge over ditch; iron post stamped "Prim. Trav. Sta. No. 15, 1915," elevation 72.764 feet	29 38 34.02	95 32 09.07	4,831
Missouri City, 1.2 miles north of, on east side of road, 1.5 feet from corner fence post, fence line southeast; copper nail in hub, post painted "U. S. B. M. No. 29," elevation 74.66 feet	29 38 12.87	95 32 31.82	2,933
Missouri City, 1 mile northwest of, 50 feet south and 10 feet east from T road corner, 1 foot from corner fence post painted "U. S. B. M. No. 30"; copper nail in hub, elevation 78.38 feet	29 37 42.26	95 32 59.90	3,962
Missouri City, about 1.75 miles northeast of, on road to Houston, 40 feet northwest of center of road, 40 feet from center of Southern Pacific R. R. track, 1 foot from telephone pole painted "U. S. B. M. No. 32"; copper nail in hub, elevation 70.27 feet	29 37 43.37	95 30 44.23	4,488
Missouri City, 2 miles northeast of; road crossing top of rail, elevation 74.2 feet			
Bellaire, about 3 miles west of, on Richmond road, 10 feet north of center of road, in wetserly one of two mesquite trees; copper nail in notch at base, tree painted "U. S. B. M. No. 79," elevation 67.89 feet	29 41 07.34	95 30 39.27	
Bellaire, about 2.25 miles west of, on Richmond Road, 45 feet south of center of road, 5 feet from corner fence post at north and south fence line, 10 feet east of gatepost; iron post stamped "Prim. Trav. Sta. No. 39, 1915," elevation 66.650 feet	29 41 26.62	95 30 00.43	3,938
Bellaire, about 2.2 miles west of; Richmond Road, about 0.4 mile north of, at corner of fence in open prairie, 6 inches from corner post painted "U. S. B. M. No. 80"; copper nail in hub, elevation 68.37 feet	29 41 47.37	95 30 00.82	2,086
Jeanetta, about 1 mile southeast of, about 150 feet south of old dredging machine in open prairie; copper nail in hub, witness stake painted "U. S. B. M. No. 81," elevation 72.18 feet	29 42 38.67	95 30 05.72	5,200
Jeanetta, about 1 mile southeast of, 300 feet west of ditch, in root of lone elm tree on prairie; copper nail, tree painted "U. S. B. M. No. 82," elevation 72.14 feet	29 42 52.55	95 30 07.05	1,403
Jeanetta, about 1 mile east of, 50 feet north of San Antonio & Aransas Pass Ry. track, 1 foot from telephone pole painted "U. S. B. M. No. 83"; copper nail in hub, elevation 70.43 feet	29 43 20.51	95 30 09.70	2,834

ALIEF QUADRANGLE—Continued.

Along Jeanetta-Hillendahl road.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Westheimer road, 1,700 feet north of Jeanetta-Hillendahl road, 25 feet north and 25 feet east of right angle bend in road, 6 inches from corner fence post painted "U. S. B. M. No. 149;" copper nail in hub, elevation 72.22 feet	29 44 30.71	95 31 22.37	.....
Buffalo Bayou, Jeanetta-Hillendahl wagon road bridge over; center of floor, elevation 64.8 feet	.....	.....	.....

Magnetic declination for quadrangle, 8° 21′ E.

From Alief west along San Antonio & Aransas Pass Railway.

San Antonio & Aransas Pass Ry. bridge No. 15.9; top of rail, elevation 85.2 feet	.....	.....	.....
Alief, about 1.1 miles west of, 36 feet north of wagon road, 35 feet south of railroad, 2 feet from telephone pole painted "U. S. B. M. 85"; copper nail in hub, elevation 81.97 feet	29 42 47.65	95 36 40.51	.....
San Antonio & Aransas Pass Ry. bridge No. 15.5; top of rail, elevation 86.2 feet	.....	.....	.....

ALMEDA QUADRANGLE.

Along International & Great Northern Railway near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Almeda, 0.8 mile north of International & Great Northern Ry. bridge 13; top of rail above ditch, elevation 56.4 feet	.....	.....	.....
Almeda, 0.9 mile north of, 40 feet east of track; copper nail in hub 1 foot from telephone pole painted "U. S. B. M. 42," elevation 53.44 feet	29 36 59.31	95 25 04.05	.....
Almeda, 0.7 mile north of; center of track at road crossing	29 36 47.99	95 25 09.03	1,225
Almeda station, about 115 feet south and 90 feet east of, 30 feet north of east and west road, 2 feet from corner fence post; iron post stamped "Prim. Trav. Sta. No. 21, 1915," elevation 61.962 feet	29 36 14.49	95 25 21.25	3,551
Almeda, about 0.6 mile east of, T road west	29 36 14.59	95 24 47.39	2,990
Almeda, about 0.75 mile southeast of, crossroads 35 feet northeast of; 1.5 feet east of telephone pole painted "U. S. B. M. 43," 2 feet from corner fence post; copper nail in hub, elevation 63.29 feet	29 35 56.13	95 24 47.12	1,865
Almeda, about 1.5 miles east by 0.3 mile south of, 25 feet north of center of road; 1 foot south of telephone pole painted "U. S. B. M. 44," copper nail in hub, elevation 63.41 feet	29 35 57.07	95 23 55.42	4,565
Almeda, about 2.4 miles east by 0.3 mile south of, 30 feet southwest of small bridge over ditch, 35 feet south of east and west road, 25 feet west of ditch, on top of small embankment inside of field; iron post stamped "Prim. Trav. Sta. No. 22, 1915," elevation 60.991 feet	29 35 57.10	95 23 02.71	4,654
Almeda, about 2.9 miles east by 0.6 mile south of, 20 feet south of east and west road; 1 foot from telephone pole painted "U. S. B. M. 45," copper nail in hub, elevation 58.18 feet	29 35 38.36	95 22 36.91	2,962

Magnetic declination near north border of quadrangle, 8° 27′ E.

ASHFORD QUADRANGLE.

From a point on Houston & Texas Central Railroad, 1.65 miles northwest of Satsuma, northeast along public road.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Satsuma, 1.5 miles north and 0.5 mile west of, 15 feet south of center of road in open prairie; witness stake painted "U. S. B. M. 286"; copper nail in hub, elevation 128.06 feet	29 55 14.44	95 36 22.73	.....
Satsuma, 1.75 miles north of, 50 feet south of public road, 80 feet southeast of small bridge; ash tree painted "U. S. B. M. 287"; copper nail in root, elevation 122.46 feet	29 55 29.04	95 35 50.89	3,167

ASHFORD QUADRANGLE—Continued.

From a point on Houston & Texas Central Railroad, 1.65 miles northwest of Satsuma, northeast along public road—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Satsuma, 2.3 miles north and 0.8 mile east of, 35 feet north and 20 feet east of crossroads in open prairie; iron post stamped "Prim. Trav. Sta. No. 129, 1915," elevation 127.880 feet	29 55 57.94	95 35 04.44	5,023
Satsuma, 2.6 miles north and 1.2 miles east of, 0.5 mile northeast of crossroads, near center line of road; oak tree painted "U. S. B. M. 288"; copper nail in root, elevation 128.74 feet	29 56 12.45	95 34 39.92	2,609
Satsuma, 3 miles north and 1.9 miles east of, 20 feet north of road; in root of oak tree on wire fence line, painted "U. S. B. M. 289"; copper nail, elevation 129.71 feet	29 56 36.75	95 34 00.87	4,223
Satsuma, 4 miles north and 2.1 miles east of, 25 feet north and 25 feet east of crossroads; iron post stamped "Prim. Trav. Sta. No. 130, 1915," elevation 128.763 feet	29 57 29.74	95 33 49.47	5,446
North Houston, 1.8 miles north and 1.5 miles west of, 1.3 miles west of Trinity & Brazos Valley Ry., 25 feet north of center of road in open prairie; witness stake painted "U. S. B. M. 290"; copper nail in hub, elevation 124.31 feet	29 57 12.61	95 32 51.42	5,392
North Houston, 1.5 miles north and 1.3 miles west of, 20 feet north and 5 feet east of crossroads, 1 foot from northeast corner of small bridge painted "U. S. B. M. 291"; copper nail in hub, elevation 123.26 feet	29 57 05.92	95 32 28.80	2,100
Satsuma, 3.4 miles north and about 4 miles east of, T road corners	29 56 56.34	95 31 56.69	2,986
North Houston, about 1.3 miles northwest of, 215 feet southeast of crossroads of West Montgomery road and Trinity & Brazos Valley Ry., 55 feet east of center of track, 30 feet west of public road, 6 feet from corner fence post; iron post stamped "Prim. Trav. Sta. No. 131, 1915," elevation 121.672 feet	29 56 36 51	95 31 31.80	2,968
Pemble's store, 5.3 miles southwest of, Trinity & Brazos Valley Ry. and West Montgomery road crossing, 0.9 mile northeast of, 12 feet north of wire fence line which bears N. 57° E., true; oak tree painted "U. S. B. M. 292"; copper nail in root, elevation 121.15 feet	29 57 10.13	95 30 53.70	4,774
Pemble's store, 4.3 miles southwest of, Trinity & Brazos Valley Ry. and West Montgomery road crossing, 1.1 miles north and 1.4 miles east of, 1.5 miles southwest of "air line" road, 100 feet southeast of Emily Hargreaves' house; mulberry tree painted "U. S. B. M. 293"; copper nail in root, elevation 118.36 feet	29 57 37.41	95 30 05.53	5,055
In northeast corner of quadrangle along Air-line road.			
Cypress Creek Bridge, 0.7 mile southeast of, on Air-line road, 20 feet west of center of road, 3 feet from corner post, on fence line west; iron post stamped "Prim. Trav. Sta. No. 122, 1915," elevation 120.421 feet	29 59 54.65	95 30 22.90	.....
Southeast from crossing of Trinity & Brazos Valley Railway and West Montgomery road.			
North Houston station, about 0.7 mile north of, on West Montgomery road, 30 feet northeast of center of road, at junction of wire and board fences, 6 inches from corner fence post, painted "U. S. B. M. 294"; copper nail in hub, elevation 117.90 feet	29 56 09.02	95 30 55.61	.....
North Houston, about 0.5 mile N. 60° E. from, 20 feet southwest of center of road, 6 inches from corner post; on fence line west, painted "U. S. B. M. 295"; copper nail in hub, elevation 111.51 feet	29 55 36.73	95 30 13.96	4,906
Along public road.			
Satsuma, 1.7 miles northwest of, 50 feet north of railroad crossing, 30 feet south of road, 18 inches south of corner fence post; copper nail in hub, pole painted "U. S. B. M. 133," elevation 130.54 feet	29 54 52.51	95 37 11.33	.....
Satsuma, 0.75 mile northwest of, 800 feet northwest of milepost 19, 50 feet north of railroad, 30 feet south of road; 1 foot from telephone pole painted "U. S. B. M. 134"; copper nail in hub, elevation 124.81 feet	29 54 22.52	95 36 28.87	4,811
Satsuma, 75 feet south of store and post office, 150 feet northwest of station signboard, 80 feet north of railroad; iron post stamped "Prim. Trav. Sta. No. 64, 1915," elevation 120.704 feet	29 53 57.75	95 35 52.54	4,060
Private road crossing, 600 feet northeast of house, top of rail, elevation 121.6 feet	.....	.....	.....
Satsuma, 1 mile southeast of, 50 feet west of T road north, 60 feet north of railroad, 30 feet south of road; 1 foot from telephone pole painted "U. S. B. M. 135"; copper nail in hub, elevation 117.22 feet	29 53 22.54	95 35 03.61	5,587

ASHFORD QUADRANGLE—Continued.

Along public road—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Satsuma, 2.1 miles southeast of, 60 feet northeast of railroad crossing, 35 feet south of T road southwest; 1 foot from fence corner post painted "U. S. B. M. 136"; copper nail in hub, elevation 112.95 feet	29 52 48.73	95 34 15.58	5,435
Satsuma, 2.65 miles southeast of, 35 feet north of center of public road, 4 feet east of telephone pole; iron post stamped "Prim. Trav. Sta. No. 65, 1915," elevation 112.020 feet	29 52 30.37	95 33 48.40	3,028

Along highways near south border of quadrangle.

Brink schoolhouse, about 4.3 miles east of, about 2.5 miles west of Houston & Texas Central R. R., 15 feet south of road, in open prairie; copper nail in hub, witness stake painted "U. S. B. M. 175," elevation 123.94 feet	29 52 44.89	95 36 41.91	.....
Brink schoolhouse, 5.3 miles east of, Houston & Texas Central R. R., 1.4 miles west of, 15 feet south of center of road in open prairie; copper nail in hub, witness stake painted "U. S. B. M. 176," elevation 120.24 feet	29 52 46.71	95 35 41.43	5,328
Houston & Texas Central R. R., 0.6 mile west of, 20 feet north of center of east and west road, 1 foot from fence line; copper nail in hub; witness stake painted "U. S. B. M. 177," no elevation	29 52 47.90	95 34 53.72	4,201

Magnetic declination for quadrangle, 8° 30′ E.

BELLAIRE QUADRANGLE.

Along highway in north half of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Houston, Blodgett subdivision, 320 feet southeast of intersection of Southern Pacific R. R. and San Antonio & Aransas Pass Ry. tracks, 30 feet from center of and in line with fence on south side of Fannin Street; iron post stamped "Prim. Trav. Sta. No. 6, 1915," elevation 53.693 feet	29 43 54.36	95 22 59.13	.....
Houston, Blodgett subdivision, crossing of Southern Pacific R. R. and San Antonio & Aransas Pass Ry.; top of rail at intersection 56.9 feet	29 43 54.56	95 23 02.78	323
Montrose, northeast corner of intersection of Mount Vernon Avenue and Richmond Road; 6 inches from telephone pole painted "U. S. B. M. No. 11"; copper nail in hub, elevation 56.10 feet	29 44 03.15	95 23 36.61	3,105
Houston, city limits on Richmond Road, 20 feet north of center line of road at bend, 28 feet north of mail box No. 13; at corner post on fence line west; copper nail in hub, "U. S. B. M. No. 12," elevation 56.56 feet	29 44 02.44	95 24 45.90	6,109
Houston, 1,800 feet west of city limits, intersection of north and south road and Richmond Road	29 43 50.57	95 25 06.70	2,191
Houston, 1,800 feet west of city limits, 230 feet west of John Smith schoolhouse, 25 feet south of Westheimer road, 5 feet from corner of blacksmith shop; iron post stamped "Prim. Trav. Sta. No. 7, 1915," elevation 60.211 feet	29 44 30.99	95 25 06.81	4,083
Houston, about 1.25 miles west of city limits, on Westheimer road, on south end of west side of stone culvert; chiseled square, "U. S. B. M. No. 13," elevation 64.49 feet	29 44 29.82	95 26 00.90	4,770
Railroad crossing, Stella cut off; top of rail, elevation 67.4 feet	.....	.....	.....
Houston, about 2.1 miles west of city limits, 80 feet west of railroad, 20 feet north of road; 1 foot from telephone pole painted "U. S. B. M. No. 14;" copper nail in hub, elevation 64.75 feet	29 44 29.01	95 26 53.84	4,668
Houston, 3 miles west of city limit, 200 feet west of Post Oak schoolhouse, opposite Fairview store, 1 foot from fence, 30 feet south of road; iron post stamped "Prim. Trav. Sta. No. 8, 1915," elevation 65.862 feet	29 44 25.64	95 27 41.22	4,190
Houston, 4.1 miles west of city limit, on Westheimer road, 1 mile west of Fairview store, 60 feet east of V. S. Ulrich's mail box; 6 inches from telephone pole painted "U. S. B. M. No. 15"; copper nail in hub, elevation 65.10 feet	29 44 15.06	95 28 37.68	5,091
Houston, 5.2 miles west of city limit, about 2 miles west of Fairview store, at east end of railing of small wooden bridge; copper nail in hub, "U. S. B. M. No. 16," elevation 70.43 feet	29 44 14.45	95 29 43.85	5,833

BELLAIRE QUADRANGLE—Continued.

Along highways in south half of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Missouri City, 2.65 miles northeast of, 25 feet northwest of center of road, 50 feet southeast of center of Southern Pacific R. R. track, 1 foot from wire fence line; iron post stamped "Prim. Trav. Sta. No. 17, 1915," elevation 70.391 feet	29 38 03.35	95 29 52.12	5,022
Missouri City, 3.5 miles northeast of, 50 feet southeast of Southern Pacific R. R. track, 40 feet northwest of shell road; 2 feet from telephone pole, painted "U. S. B. M. No. 33"; copper nail in hub, elevation 70.30 feet	29 38 21.34	95 29 05.71	4,482
Missouri City, 4.4 miles northeast of, 40 feet southeast of Southern Pacific R. R. track, 40 feet northeast of road, 400 feet west of house; 2.5 feet from telephone pole painted "U. S. B. M. No. 34"; copper nail in hub, elevation 69.60 feet	29 38 39.31	95 28 19.01	4,502
Missouri City, 5.2 miles northeast of, 25 feet northwest of road, 55 feet southeast from Southern Pacific R. R. track, about 350 feet northeast of signboard "Station 1 mile"; 1 foot from wire fence; iron post stamped "Prim. Trav. Sta. No. 18, 1915," elevation 69.056 feet	29 38 56.08	95 27 35.24	4,218
Missouri City, 5.6 miles northeast of, 45 feet southeast of Southern Pacific R. R., about 70 feet southeast from shell road crossing of railroad; 3 feet from telephone pole painted "U. S. B. M. No. 35;" copper nail in hub, elevation 66.49 feet	29 39 09.40	95 27 00.88	3,317
Stella, 2.5 miles southwest of, 2,000 feet southwest of section house, 50 feet southeast of Southern Pacific R. R. track, 20 feet northwest of second-class road; 2 feet from telephone pole painted "U. S. B. M. No. 36"; copper nail in hub, elevation 65.56 feet	29 39 27.97	95 26 12.79	4,640
Stella, 1.5 miles southwest of, opposite signboard "1 mile to station," 42 feet southeast of center of Southern Pacific R. R. track; iron post stamped "Prim. Trav. Sta. No. 19, 1915," elevation 60.251 feet	29 39 44.17	95 25 24.21	4,588
Stella, 0.4 mile southwest of, 275 feet southwest of whistle post, 50 feet southeast of Southern Pacific R. R. track; 1.5 feet from post in right-of-way fence, painted "U. S. B. M. No. 37"; copper nail in hub, elevation 50.04 feet	29 40 01.93	95 24 25.02	5,523
Stella station; top of rail opposite semaphore, elevation 56.7 feet			
Pierce Junction, center of tracks at; top of rail, elevation 55.2 feet	29 40 13.84	95 23 47.16	3,551

Along International & Great Northern Railway.

Pierce Junction, 332 feet south of, 35 feet east of track, 35 feet west of center of public road; 1 foot from telephone pole painted "U. S. B. M. No. 38"; copper nail in hub, elevation 52.45 feet	29 40 10.63	95 23 47.99	332
Pierce Junction, 0.9 mile south of, 40 feet east of track, 150 feet south of sign "1 mile to R. R. crossing"; 1 foot from telephone post painted "U. S. B. M. No. 39"; copper nail in hub, elevation 59.28 feet	29 39 28.32	95 24 04.70	4,492
Pierce Junction, 1.75 miles south of, 900 feet south of switch, 40 feet east of track; 1 foot from telephone pole painted "U. S. B. M. No. 40"; copper nail in hub, elevation 56.92 feet	29 38 46.53	95 24 21.45	4,501
Almeda, 2.6 miles north of, 48 feet east of track, opposite mile board No. 9, nearly opposite white house west of road; iron post stamped "Prim. Trav. Sta. No. 20, 1915"; elevation 56.100 feet	29 38 27.50	95 24 28.91	2,030
Almeda, 2.1 miles north of, I. & G. N. Ry. bridge No. 17; top of rail, elevation 55.9 feet			
Almeda, 1.8 miles north of, 450 feet north of T road west to white house, 35 feet east of track; 1 foot from telephone pole painted "U. S. B. M. No. 41"; copper nail in hub, elevation 55.46 feet	29 37 44.09	95 24 46.29	4,645
Blodgett, 1 mile south of, on south end of east side of Southern Pacific R. R. bridge 5 C; copper nail and washer painted "U. S. B. M. No. 66," elevation 52.94 feet	29 43 05.80	95 22 48.45	
Southern Pacific R. R. bridge over Brays Bayou, No. 6 A; top of rail, elevation 51.4 feet			

Along Southern Pacific Railroad.

Blodgett, 2 miles south of, 50 feet north of T road west, 30 feet west of Almeda road; 1 foot from telephone pole painted "U. S. B. M. No. 67"; copper nail in hub, elevation 48.37 feet	29 42 14.29	95 23 05.60	5,418
Blodgett, 2.6 miles south of, about 450 feet west of small bungalow on east side of road, in fence corner, 35 feet northeast of T road east to house; iron post stamped "Prim. Trav. Sta. No. 33, 1915," elevation 50.934 feet	29 41 49.77	95 23 13.27	2,567
Pierce Junction, about 1 mile northeast of, on east side of track and west side of Almeda road, 1 foot from telephone pole painted "U. S. B. M. No. 68"; copper nail in hub, elevation 50.59 feet	29 41 03.56	95 23 29.78	4,889

BELLAIRE QUADRANGLE—Continued.

Along Southern Pacific Railroad—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Pierce Junction, about 0.3 mile north and 0.9 mile east of, 80 feet south of signboard "R. R. crossing 1 mile," 45 feet southeast from center of railroad track; iron post stamped "Prim. Trav. Sta. No. 34, 1915," elevation 52.612 feet	29 40 29.97	95 22 51.80	.....
Jeannetta, about 1.5 miles east of, 0.4 mile north of railroad track, in open prairie, 50 feet west of drainage ditch; copper nail in hub, witness stake painted "U. S. B. M. No. 84," elevation 69.95 feet	29 43 42.97	95 29 44.12	.....
Near north border of quadrangle.			
Houston, intersection of Westheimer and Shepherd dam roads, 30 feet north and 30 feet west of, 6 inches from corner fence post painted "U. S. B. M. 148"; copper nail in hub, elevation 58.63 feet	29 44 32.55	95 24 38.54	.....

Magnetic declination in quadrangle, 8° 13′ E.

BURNETT BAY QUADRANGLE.

Along public road between Crosby and Lynchburg.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Crosby, 3.0 miles south and 0.4 mile east of, 25 feet west of road, 30 feet south of drain pipe under road, 1 foot east of telephone pole painted "U. S. B. M. 382"; copper nail in hub, elevation 46.01 feet	29 51 55.86	95 03 40.50	.....
Crosby, 3.5 miles south and 0.5 mile east of, 1,100 feet south of angle in road, 25 feet west of road and 15 feet north of gateway, 2½ feet from wire fence; iron post stamped "Prim. Trav. Sta. No. 164, 1915," elevation 49.148 feet	29 51 30.09	95 03 34.44	2,658
Crosby, 4.2 miles south and 0.6 mile east of, 250 feet northeast of a residence, 25 feet west of road at wire fence line; pine tree painted "U. S. B. M. 383"; copper nail in root, elevation 46.80 feet	29 50 54.26	95 03 30.50	3,638
Crosby, 5.3 miles south and 0.6 mile east of, 140 feet south of south end of bridge, 25 feet east of road; willow tree painted "U. S. B. M. 384"; copper nail in root, elevation 22.76 feet	29 49 55.21	95 03 27.06	5,971
Elena post office, 250 feet south of, 150 feet south of canal at San Jacinto Rice Co.'s plantation, 25 feet west of road and 10 feet south of gateway iron post stamped "Prim. Trav. Sta. No. 165, 1915," elevation 44.723 feet	29 49 35.28	95 03 27.06	2,015
Elena, 0.6 mile south of; crossroads	29 49 06.89	95 03 26.50	2,871
Elena, 0.9 mile south of, 1,870 feet south of crossroads, 25 feet east of road; persimmon tree painted "U. S. B. M. 385"; copper nail in root, elevation 41.03 feet	29 48 48.55	95 03 25.64	1,856
Elena, 1.9 miles south and 0.1 mile east of, 25 feet west of road; oak tree painted "U. S. B. M. 386"; copper nail in root, elevation 39.40 feet	29 47 57.94	95 03 22.18	5,122
Lynchburg, 1.75 miles north and 1.25 miles east of, 25 feet west and 20 feet north of T road east, 3 feet from fence line; iron post stamped "Prim. Trav. Sta. No. 166, 1915," elevation 39.431 feet	29 47 22.89	95 03 28.16	3,581
Lynchburg, 1 mile north and 0.9 mile east of, 35 feet west of center of road, in woods; ash tree painted "U. S. B. M. 387"; copper nail in root, elevation 4.08 feet	29 46 41.35	95 03 49.63	4,604
Lynchburg, 0.1 mile north and 1,800 feet east of, on what is known as Tory Hill, the northeast corner of fence around the residence of E. Sandow is distant 102 feet and the southeast corner of fence is distant 54.5 feet. Station is marked by a U. S. Corps of Engineers standard station mark, elevation 28.121 feet. There are two U. S. Corps of Engineers standard reference marks set flush with the ground, one 105.6 feet N. 89° 40′ W., in line with a large cedar tree 138 feet from the station, and the other 83.6 feet N. 0° 50′ W., in line with a large hackberry tree, 34 feet from the station	29 45 57.47	95 04 23.51	5,347
Lynchburg, about 0.4 mile south and 0.5 mile west of, about 1,500 feet north of San Jacinto battleground reservation, 200 feet north of schoolhouse, 70 feet north of road to ferry and 140 feet west of Lynchburg-Deer Park road; cottonwood tree painted "U. S. B. M. 388"; copper nail in root, elevation 5.90 feet	29 45 33.35	95 05 15.76	5,210

BURNETT BAY QUADRANGLE—Continued.

Along public road betweem Crosby and Lynchburg—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Lynchburg, 1.25 miles west of, 0.6 mile northwest of upper ferry across ship channel, 25 feet northeast of center of road, on bluff at edge of old river channel; elm tree painted "U. S. B. M. 389"; copper nail in root, elevation 26.72 feet	29 45 45.40	95 05 57.10	3,841
Floor of bridge over drain, elevation 7.2 feet			
Lynchburg, 0.3 mile north and 2.1 miles west of, 20 feet south of road at edge of pine woods, 480 feet west of bridge over ravine; iron post stamped "Prim. Trav. Sta. No. 167, 1915," elevation 32.804 feet	29 46 09.04	95 06 48.42	5,116
Near west border of quadrangle.			
Lynchburg, 1.5 miles north and 2.75 miles west of, 25 feet east of center of road; pine tree painted "U. S. B. M. 406"; copper nail in root, elevation 40.40 feet	29 47 11.44	95 07 28.23	7,214
Lynchburg, 2.5 miles north and 2.7 miles west of, 25 feet east of road and 10 feet south of a private road east; 3 feet from tall post at gateway; iron post stamped "Prim. Trav. Sta. No. 175, 1915, elevation 44.345 feet	29 48 06.14	95 07 25.97	5,528
Sheldon, 1,800 feet northeast of, 50 feet southeast of center of road; oak tree painted "U. S. B. M. 344"; wire nail in root, elevation 49.70 feet	29 52 26.12	95 06 48.05	
Sheldon, 500 feet southwest of Texas & New Orleans station, 75 feet south of track, on west end of steel culvert, in top of pine post; copper nail painted "U. S. 49.5 B. M," elevation 49.70 feet			
Sheldon, opposite operator's window, top of nearest rail, elevation 52.5 feet			
Lynchburg, 0.3 mile north by 2.6 miles west of crossroads, in floor of wooden culvert, southwest corner; copper nail painted "U. S. 34.7 B. M.," elevation 34.93 feet			
Near northeast border of quadrangle.			
Crosby, 2.25 miles south and 2.7 miles east of, T road easterly	29 52 15.30	95 01 02.33	
Crosby, 2.5 miles south and 3 miles east of, 25 feet northeast of center of road; 1 foot west of telephone pole painted "U. S. B. M. 424"; copper nail in hub, elevation 42.70 feet	29 52 00.29	95 00 44.88	2,159
Along Cedar Bayou-Lynchburg road.			
Lynchburg, 0.9 mile south and 2.5 miles east of, near place formerly known as Wooster, in front of house of Junius Brown, 20 feet south of road, in top of concrete horse block; bronze tablet stamped "Prim. Trav. Sta. No. 185, 1915," elevation 30.162 feet	29 45 03.24	95 02 09.28	
Lynchburg, 0.15 mile south and 2.8 miles east of, 20 feet east of center of road; oak tree painted "U. S. B. M. 439"; copper nail in root, elevation 31.28 feet	29 45 43.83	95 01 55.10	4,286
Lynchburg, 0.5 mile north and 2.8 miles east of, 20 feet west of road; oak tree painted "U. S. B. M. 440"; copper nail in root, elevation 32.50 feet	29 46 19.55	95 01 55.16	3,608
Lynchburg, 1.5 miles north and 2.8 miles east of, 20 feet south and 25 feet east of T road south, 20 feet west of rice irrigation canal, 15 feet north of corner fence post; iron post stamped "Prim. Trav. Sta. No. 186, 1915," elevation 37.123 feet	29 47 12.13	95 01 55.63	5,311
Lynchburg, 1.6 miles north and 2 miles east of, 20 feet north of center of road; oak tree on wire fence line painted "U. S. B. M. 441"; copper nail in root, elevation 35.94 feet	29 47 17.53	95 02 45.98	4,470

Magnetic declination for west side of quadrangle, 8° 15′ E.; for center, 8° 10′ E.; for northeast quarter, 8° 10′ E.; for southeast quarter, 8° 10′ E.

CEDAR BAYOU QUADRANGLE.

Along Crosby-Cedar Bayou road.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Cedar Bayou post office, 7 miles north and 4.2 miles west of, 25 feet northeast of road, 30 feet northwest of gateway at entrance to farmyard; 1 foot from telephone pole painted "U. S. B. M. 425"; copper nail in hub, elevation 40.58 feet	29 51 20.33	94 59 59.51	
Cedar Bayou post office, 6.4 miles north and 3.5 miles west of, 1,170 feet northwest of angle in road, 25 feet southwest of road, 10 feet southeast of gateway, nearly opposite frame house across road; iron post stamped "Prim. Trav. Sta. No. 179, 1915," elevation 41.265 feet	29 50 42.75	94 59 17.59	5,295
Cedar Bayou post office, 6.4 miles north and 2.6 miles west of, 25 feet north and 25 feet east of T road south, under wire fence line; 2 feet east of telephone pole painted "U. S. B. M. 426"; copper nail in hub, elevation 36.00 feet	29 50 42.42	94 58 23.66	4,750
Cedar Bayou post office, 5.5 miles north and 2.4 miles west of, 30 feet northeast of center of road, opposite frame house across road; 18 inches northeast of telephone pole painted "U. S. B. M. 427"; copper nail in hub, elevation 37.32 feet	29 49 52.36	94 58 12.90	5,145
Cedar Bayou post office, 4.6 miles north and 2.3 miles west of, 40 feet south and 10 feet west of crossroads, 12 feet southwest of corner of small bridge; iron post stamped "Prim. Trav. Sta. No. 180, 1915," elevation 37.039 feet	29 49 24.41	94 58 07.56	2,863
Cedar Bayou post office, 3.8 miles north and 2.1 miles west of, Ellis League brick schoolhouse, No. 15, in lower concrete step, southwest corner, painted "U. S. B. M 428"; chiseled square, elevation 38.00 feet	29 48 27.89	94 57 53.53	5,842
Cedar Bayou post office, 3.8 miles north and 2 miles west of, T road south	29 48 28.10	94 57 43.85	855
Cedar Bayou post office, 2.9 miles north and 1.35 miles west of, 40 feet east of road at forks; 1 foot west of telephone pole painted "U. S. B. M. 429"; copper nail in hub, elevation 32.50 feet	29 47 49.84	94 57 35.17	3,940
Cedar Bayou post office, 2.15 miles north and 1.5 miles west of, 45 feet east and 20 feet south of crossroads, 3 feet north of corner fence post; iron post stamped "Prim. Trav. Sta. No. 181, 1915," elevation 34.970 feet	29 47 27.50	94 57 17.19	2,757
Cedar Bayou post office, 2 miles north and 1 mile west of; crossroads.	29 46 50.99	94 56 47.99	4,497
Cedar Bayou post office, 1.8 miles north and 0.9 miles west of, 1,500 feet northwest of forks or road, 30 feet southeast of road, close to fence line; 1 foot southeast of telephone pole painted "U. S. B. M. 430"; copper nail in hub, elevation 30.57 feet	29 46 43.65	94 56 41.68	926
Cedar Bayou post office, 0.9 mile north and 0.6 mile west of, 30 feet north and 30 feet west of crossroads; 1 foot south of large corner fence post painted "U. S. B. M. 431"; copper nail in hub, elevation 32.16 feet	29 45 56.17	94 56 22.75	5,079
Cedar Bayou post office, 1 mile north of, 30 feet north of center of road and just west of angle in road; oak tree painted "U. S. B. M. 432"; copper nail in root, elevation 25.24 feet	29 46 02.04	94 55 45.29	3,355
Cedar Bayou post office, 1 mile north and 0.6 mile east of, ¼ mile east of ferry across bayou, at forks of road, 115 feet S. 16° W. from corner of R. J. Tompkin's house; iron post stamped "Prim. Trav. Sta. No. 182, 1915," elevation 23.553 feet.	29 46 04.54	94 55 12.35	2,914
Cedar Bayou post office, 0.3 mile north and 0.2 mile east of, 900 feet northeast of Masonic Hall, 15 feet southeast of road on top of concrete culvert wall, painted 'U.S.B.M.433"; chiseled square, elevation 21.03 feet	29 45 25.54	94 55 36.54	4,480
Cedar Bayou post office, about 550 feet northeast of, in top of east end of concrete culvert; chiseled square painted "U. S. 6.3 B. M.," elevation 6.41 feet			

Magnetic declination for center of quadrangle, 8° 07′ E.; for south side, 8° 02′ E.

CLODINE QUADRANGLE.

Along San Antonio & Aransas Pass Railway.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Alief, 2 miles west of, 30 feet north of wagon road, 40 feet south of railroad, 1 foot from telephone pole milepost 17; copper nail in hub, pole painted "U. S. B. M. 86"; elevation 83.52	29 42 43.15	95 37 35.41	
Clodine, 2.7 miles east of, 45 feet northeast of T road north, 55 feet southeast of railroad crossing north and south road, 1 foot from fence corner, 200 feet west of milepost 18; iron post stamped "Prim. Trav. Sta. 40, 1915, 85," elevation 85.498	29 42 38.08	95 38 36.98	5,153

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CLODINE QUADRANGLE—Continued.

Along San Antonio & Aransas Pass Railway—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
San Antonio & Aransas Pass Ry. bridge 18.5 top of rail, elevation 89.1			
Clodine, 1.7 miles east of, 50 feet northeast of T road north, 40 feet southeast of railroad crossing, 1 foot from fence corner post, 250 feet northeast of a small bungalow; copper nail in hub, post painted "U. S. B. M. 87," elevation 89.850	29 42 33.20	95 39 36.70	5,290
Clodine, 1 mile east of, 49 feet north of railroad track, 20 feet south of wagon road, about 200 feet south of small yellow house; copper nail in hub, "U. S. B. M. 88," elevation 93.53	29 42 30.93	95 40 16.10	3,483
Clodine station, about 1,000 feet northeast of, at corner of county; a concrete monument 12 inches square and 15 inches above ground marked "10 miles," no elevation	29 42 34.62	95 41 09.23	4,700
Clodine, about 240 feet south of road crossing, which is 140 feet west of San Antonio & Aransas Pass Ry. station, 25 feet west of center of north and south road and about 1.5 feet from corner fence post; iron post stamped "Prim. Trav. Sta. No. 41, 1915," elevation 95.202 feet	29 42 22.98	95 41 17.10	1,364

Along Clodine-Barker road.

Clodine, 1 mile north of, 25 feet west of center of road, 3 feet south of fence corner at fence line west; copper nail in hub, post painted "U. S. B. M. 89," elevation 93.24	29 43 16.59	95 41 16.59	5,416
Clodine, about 2 miles north of, 50 feet north of T road corners, roads east, west, and north, 1 foot from fence post; copper nail in hub, post painted "U. S. B. M. 90," elevation 92.12	29 44 05.06	95 41 16.30	4,896
Clodine, about 2.7 miles north of, 2.6 miles south of Barker, 0.7 mile south of bridge over Buffalo Bayou, on east side of road, close to wire fence, opposite small wooden bridge; iron post stamped "Prim. Trav. Sta. No. 42, 1915," elevation 87.716	29 44 46.61	95 41 06.17	4,291

Magnetic declination for north half of quadrangle, 8° 30′ E.

CROSBY QUADRANGLE.

Along Huffman-Crosby road.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Crosby, 5.5 miles north and 1.4 miles west of, 20 feet west of center of road, on south side of private road west, opposite gate on east side of road, 1 foot north of telephone pole, painted "U. S. B. M. 336;" wire nail in hub, elevation 63.58 feet	29 59 20.44	95 05 29.33	
Crosby, 4.6 miles north and 1.2 miles west of, 100 feet north of a fence corner 25 feet west of road, 1 foot east of telephone pole painted "U. S. B. M. 337;" wire nail in hub, elevation 64.37 feet	29 58 35.27	95 05 18.60	4,660
Crosby, 4.1 miles north and 1.1 miles west of, 30 feet east and 30 feet south of T road east, 3 feet southeast of corner fence post; iron post stamped "Prim. Trav. Sta. No. 146, 1915," elevation 60.778 feet	29 58 08.97	95 05 11.92	2,722
Crosby, 3.7 miles north and 1 mile west of; T road west, near Gum Gulley schoolhouse	29 57 45.17	95 05 07.45	2,438
Crosby, 3.2 miles north and 0.8 mile west of, 3,000 feet south of Gum Gulley schoolhouse, 30 feet west of center of road, at north end of gate; 6 inches from gate post, painted "U. S. B. M. 338;" wire nail in hub, elevation 57.48 feet	29 57 19.10	95 04 53.46	2,907
Crosby, 2.5 miles north and 0.4 mile west of, 50 feet east of road at angle; gum tree painted "U. S. B. M. 339;" wire nail in root, elevation 55.77 feet	29 56 44.44	95 04 32.37	3,963
Crosby, 1.5 miles north and 0.3 mile west of, 30 feet west of public road and nearly opposite a residence on east side of road, 10 feet north of gate into field, and 4 feet west of fence line; iron post stamped "Prim. Trav. Sta. No. 147, 1915," elevation 53.907 feet	29 55 52.00	95 04 22.86	5,364
Crosby, 0.7 mile north of, 160 feet south of T road east, 40 feet west of center of road; pine tree painted "U. S. B. M. 340;" wire nail in root, elevation 50.07 feet	29 55 10.05	95 04 14.68	4,302
Crosby station, Texas & New Orleans R. R., 100 feet northeast of, public road crossing	29 54 34.11	95 04 06.12	3,710
Crosby, 410 feet southeast of road crossing, on top of concrete culvert guard wall, east side of culvert, 6 inches from north end of wall; chiseled square painted "U. S. B. M. 341," elevation 49.35 feet	29 54 31.03	95 04 03.14	407

CROSBY QUADRANGLE—Continued.

Along Crosby-Houston road.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Crosby, 1.1 miles south and 0.3 mile east of, 30 feet west of center of road, 15 feet east of fence line, 3 feet northwest of telephone pole; iron post stamped "Prim. Trav. Sta. No. 148, 1915," elevation 49.913 feet	29 53 36.82	95 03 48.67	5,623
Crosby, 2 miles south and 0.3 mile east of, 30 feet south and 25 feet east of intersection of roads; top of wing wall of concrete culvert, painted "U. S. B. M. 342;" chiseled square, elevation 45.88 feet.	29 52 46.40	95 03 47.43	5,096
Crosby, 2.1 miles south and 0.8 mile west of, about 0.8 mile east of San Jacinto River, 30 feet south of public road near bend; gum tree painted "U. S. B. M. 343;" wire nail in root, elevation 19.17 feet	29 52 45.83	95 04 54.01	5,863
Crosby, 2.3 miles south and 1.7 miles west of 680 feet west of center pier of iron bridge over San Jacinto River, 20 feet north of center of road; iron post stamped "Prim. Trav. Sta. No. 149, 1915," elevation 27.407 feet	29 52 33.64	95 05 47.08	4,831
Near southeast corner of quadrangle.			
Sheldon, about 0.5 mile north and 1,000 feet west of, 6 feet east of road in woods; oak tree painted "U. S. B. M. 348;" wire nail in root, elevation 29.51 feet	29 52 46.10	95 07 17.53	.....
Along road toward Cedar Bayou and north near east side of quadrangle.			
Crosby, 2.0 miles south and 1.25 miles east of, 25 feet south of road at lane south; 8 inches south of telephone pole painted "U. S. B. M. 422;" copper nail in hub, elevation 54.68 feet	29 52 47.00	95 02 49.37	.....
Crosby, 2.3 miles south and 2.0 miles east of, 30 feet north and 35 feet east of crossroads; 6 inches east of telephone pole painted "U. S. B. M. 423;" copper nail in hub, elevation 48.90 feet	29 52 35.25	95 02 08.58	3,782
Crosby, 2.3 miles south and 2.7 miles east of; at angle in road, 35 feet northeast of center of road going to Cedar Bayou and 65 feet east of T road north, 4 feet west of corner fence post at angle in fence; iron post stamped "Prim. Trav. Sta. No. 178, 1915," elevation 47.051 feet	29 52 35.57	95 01 24.56	3,876
Crosby, 1.5 miles south and 2.7 miles east of, 25 feet north and 25 feet west of crossroads; 1 foot north of corner fence post painted "U. S. B. M. 479;" copper nail in hub, elevation 49.43 feet	29 53 15.63	95 01 25.97	4,050
Crosby, 0.75 mile south of, and 2.6 miles east of, 100 feet southwest of schoolhouse, 25 feet north and 25 feet east of T road north; 6 inches southwest of corner fence post, painted "U. S. B. M. 480;" copper nail in hub, elevation 50.98 feet	29 53 54.91	95 01 29.38	3,980
Crosby, 2.5 miles east of, 30 feet north and 30 feet east of T road west, in open prairie; iron post stamped "Prim. Trav. Sta. No. 200, 1915," elevation 53.753 feet	29 54 40.20	95 01 39.47	4,661
Crosby, 0.9 mile north and 2.3 miles east of, 20 feet east of road at fence lines north and east; 1 foot west of corner fence post painted "U. S. B. M. 481;" copper nail in hub, elevation 55.23 feet	29 55 21.96	95 01 48.89	4,301
Crosby, 1.8 miles north and 2.1 miles east of, 50 feet south of Texas & New Orleans R. R., 20 feet north of public road at T road south; 1 foot east of telephone pole painted "U. S. B. M. 482;" copper nail in hub, elevation 55.55 feet	29 56 09.90	95 02 00.18	4,945
Crosby, 2.3 miles north and 2.7 miles east of, 30 feet south of public road and 75 feet west of corner of schoolhouse, 8 feet northeast of corner fence post; iron post stamped "Prim. Trav. Sta. No. 201, 1915," elevation 51.718 feet	29 56 35.82	95 01 25.48	4,022
Crosby, 2.9 miles north and 3.7 miles east of, 60 feet south of Texas & New Orleans R. R., 20 feet north of public road, at southwest end of gate; 1 foot south of gate post painted "U. S. B. M. 483;" copper nail in hub, elevation, 57.18 feet	29 57 06.25	95 00 46.65	4,595
Crosby, 3.5 miles north and 4 miles east of, 40 feet south of center of road; pine tree painted "U. S. B. M. 484;" copper nail in root, elevation 56.74 feet	29 57 36.17	95 00 05.76	4,699
Crosby, 3.6 miles north and 3.4 miles east of, 90 feet west of road; sassafras tree painted "U. S. B. M. 485;" copper nail in root, elevation, 60.19 feet	29 57 40.52	95 00 44.56	3,442
Crosby, 3.5 miles north and 2.8 miles east of; T road corner east, west, and north	29 57 37.79	95 01 16.21	2,799
Crosby, 3.8 miles north and 2.8 miles east of, 30 feet east of road; 6 inches west of corner fence post painted "U. S. B. M. 486;" copper nail in hub, elevation 60.30 feet	29 57 55.25	95 01 17.43	1,768
Crosby, 4.8 miles north and 2.8 miles east of, 35 feet west of road, on small mound in open prairie; iron post stamped "Prim. Trav. Sta. No. 203, 1915," elevation 65.594 feet	29 58 47.25	95 01 18.95	5,256
Crosby, 5.6 miles north and 2.6 miles east of, 830 feet west of right angle in road, 35 feet north of road; ash tree painted "U. S. B. M. 487," copper nail in root, elevation 62.38 feet	29 59 28.87	95 01 28.60	4,290

CROSBY QUADRANGLE—Continued.

On prairie west of Cedar Bayou.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Crosby, 5.6 miles north and 2 miles east of, at north edge of prairie and south edge of timber fringing Cedar Bayou; ash tree painted "U. S. B. M. 488," copper nail in root, elevation 60.39 feet	29 59 29.15	95 02 07.89	3,456
Crosby, 6 miles north and 1.4 miles east of, group of about 25 small gum trees on prairie, one of which is painted "U. S. B. M. 489"; copper nail in root, elevation 62.77 feet	29 59 48.79	95 02 42.42	3,628

On unchecked spur line west from Crosby-Huffman road.

Crosby, 2.7 miles north and 0.6 mile west of T road corner north, south, and west	29 56 56.18	95 04 39.73	.....
Crosby, 2.7 miles north and 1.2 miles west of, near center of road; pine tree painted "U. S. B. M. 542," copper nail in root, elevation 58.07 feet	29 56 55.86	95 05 16.31	3,218
Crosby, 2.6 miles north and 2.15 miles west of, 50 feet south of small house and 25 feet north of road; oak tree painted "U. S. B. M. 543," copper nail in root, elevation 64.85 feet	29 56 53.02	95 06 15.92	5,252
Crosby, 2.6 miles north and 3 miles west of, in thick woods, 78 feet south of a wire fence, which bears about 5° south of west, north side of a dim road, iron post stamped "Prim. Trav. Sta. No. 223, 1915," elevation 68.772 feet	29 56 52.28	95 07 06.19	4,424

Near Crosby.

Crosby, Texas & New Orleans R. R. station, opposite operator's window; top of rail, elevation 48.8 feet	.....	.....	.....
Crosby, 3.3 miles northeast of, 1.6 miles northeast of Adlong schoolhouse, at T road northwest, 100 feet south of cattle guard 337B, 75 feet southeast of Texas & New Orleans R. R. track, in top of sawed-off post; copper nail painted "U. S. 59.4 B. M.," elevation 59.29 feet	.....	.....	.....
Crosby, 2.75 miles north of, at private T road west, 400 feet southeast of frame dwelling, west side of culvert, southwest corner of wooden bridge, in floor; copper nail painted "U. S. 58.6 B. M.," elevation 58.68 feet	.....	.....	.....

Magnetic declination for northwest quarter of quadrangle, 8° 30′ E.; for center, 8° 26′ E.; for east side, 8° 23′ E.; for south side; 8° 23′ E.

CYPRESS QUADRANGLE.

Along Washington road.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Cypress, 3.3 miles northwest of, about 800 feet east of mile board "1 mile to Swanson," 25 feet south of center of road and 50 feet north of railroad, 6 inches from telephone pole; copper nail in hub, pole painted "U. S. B. M. 114," elevation 157.83 feet	29 59 22.21	95 44 46.91	.....
Cypress, 2.3 miles northwest of, about halfway between mileposts 28 and 29, 60 feet north of Houston & Texas Central R. R., 30 feet south of public road, 2 feet north of telephone pole; iron post stamped "Prim. Trav. Sta. No. 55, 1915," elevation 155.826 feet	25 59 04.30	95 43 59.45	4,548
Azimuth from primary traverse station 55 to church steeple equals 233° 50′	.....	.....	.....
Cypress, 1.2 miles northwest of, 60 feet north of Houston & Texas Central R. R., 50 feet south of public road, 1 foot from telephone pole; copper nail in hub, pole painted "U. S. B. M. 115," elevation 154.13 feet	29 58 39.14	95 42 52.96	6,377
Cypress, 0.5 mile northwest of, 25 feet south of wagon road, 60 feet north of track, 1 foot from telephone pole; copper nail in hub, pole painted "U. S. B. M. 116," elevation 152.14 feet	29 58 25.63	95 42 17.79	3,381
Cypress, 140 feet east of station, Houston & Texas Central R. R., 50 feet north of center of track, 20 feet south of center of road, 3 feet west of telephone post, 3 feet north of fence line, 60 feet southwest of corner of Jnergen's saloon; iron post stamped "Prim. Trav. Sta. No. 56, 1915," elevation 150.275 feet	29 58 08.21	95 41 52.05	2,869

CYPRESS QUADRANGLE—Continued.

Along Washington road—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Cypress, 0.9 mile southeast of, 30 feet south of road, 40 feet north of railroad, 6 inches from telephone pole; copper nail in hub, pole painted "U. S. B. M. 129," elevation 142.58 feet	29 57 38.64	95 41 09.34	4,800
Cypress, 1.8 miles southeast of, 35 feet south of road, 60 feet north of railroad, 1,000 feet east of Big Cypress Creek, 18 inches from telephone pole; copper nail in hub; pole painted "U. S. B. M. 130," elevation 145.27 feet	29 57 11.13	95 40 29.62	4,462
Cypress, 2.8 miles southeast of, 35 feet north of road, 130 feet north of Houston & Texas Central R. R., 4 feet east of corner fence post; iron post stamped "Prim. Trav. Sta. No. 62, 1915," elevation 143.018 feet	29 56 38.31	95 39 41.19	5,398
Cypress, 3.3 miles southeast of, T road south; top of rail at road crossing, elevation 144.3 feet			
Cypress, 3.7 miles southeast of, 30 feet south of road, 70 feet north of railroad, 40 feet south of T road north, 1 foot from telephone pole; copper nail in hub, pole painted "U. S. B. M. 131," elevation 140.35 feet	29 56 07.68	95 38 58.21	4,886
Cypress, 4.4 miles southeast of, 100 feet east of railroad crossing, 25 feet south of road, 60 feet north of railroad, 1 foot from telephone pole; copper nail in hub, pole painted "U. S. B. M. 132," elevation 136.37 feet	29 55 44.24	95 38 24.82	3,774
Satsuma, 2.6 miles southwest of, 400 feet east of milepost 21, 5 feet west of corner fence post, 30 feet north of road, 100 feet north of railroad; iron post stamped "Prim. Trav. Sta. No. 63, 1915," elevation 134.619 feet	29 55 23.62	95 37 54.49	3,385
From Cypress south and southwest along highways to southwest corner of quadrangle.			
Cypress, 4,200 feet southwest of, about 1,000 feet east of house, 1 foot from north gatepost; copper nail in hub (T. B. M. 117), no elevation	29 57 51.70	95 42 32.93	
Cypress, 1 mile southwest of, on road to Bain's ranch, 2,200 feet south to t. b. m. 117, by north gatepost; copper nail in hub, elevation 145.89 feet			
Cypress, 1 mile south by 0.8 mile west of, 400 feet north of Cypress Creek, at ranch of Mr. Anderson (Mr. Bain, lessee), at corner of barbed and woven wire fence, in root of water oak; copper nail, tree painted "U. S. B. M. 118," elevation 143.68 feet	29 57 13.45	95 42 40.48	3,922
Cypress, 2 miles south by 0.8 mile west of, 0.8 mile south of Bain ranch, 20 feet south of east and west fence line, at gateway in open prairie; iron post stamped "Prim. Trav. Sta. No. 57, 1915," elevation 153.279 feet	29 56 22.82	95 42 39.91	5,115
Cypress, 2.9 miles south by 0.9 mile west of, 1.7 miles south of Bain ranch, in open pasture about 60 feet west of roadway leading through, on slight knoll; wire nail in hub, witness stake painted "U. S. B. M. 119," elevation 149.82 feet	29 55 36.63	95 45 45.23	4,690
Cypress, 3.6 miles south by 1 mile west of, at east and west line fence between two large pastures, 2 feet east of gatepost; wire nail in hub, post painted "U. S. B. M. 120," elevation 147.78 feet	29 55 01.17	95 42 52.12	3,633
Cypress, 4.5 miles south by 1.2 miles west of, in open prairie on small mound; wire nail in hub with witness stake painted "U. S. B. M. 121"	29 54 15.84	95 43 05.15	4,722
Cypress, 5.2 miles south by 1.4 miles west of, 3 feet south of east and west line, 25 feet west of gateway; iron post stamped "Prim. Trav. Sta. 58, 1915," elevation 144.653 feet	29 53 38.27	95 43 19.50	4,000
Cypress, 6.2 miles south by 1.7 miles west of, in open prairie, 3,500 feet north, 12° W. of house (true bearing); wire nail in hub, witness stake painted "U. S. B. M. 122," elevation 140.16 feet	29 52 46.23	95 43 33.45	5,400
Along highways near south border of quadrangle.			
Brink schoolhouse, T road east at	29 52 42.83	95 40 59.43	1,794
Brink schoolhouse, 2,250 feet east of, 20 feet north of center of road; copper nail in hub; witness stake painted "171" (should be 172), elevation 130.58 feet	29 52 43.16	95 40 33.99	2,240
Brink schoolhouse, 1.5 miles east of, 15 feet south of road in open prairie; copper nail in hub; witness stake painted "U. S. B. M. 173," elevation 127.26 feet	29 52 43.20	95 39 25.84	6,000
Brink schoolhouse, 2.6 miles east of, 20 feet south of center of east and west road; copper nail in hub, 6 inches from telephone pole painted "U. S. B. M. 174," elevation 127.23 feet	29 52 43.80	95 38 24.55	5,397
Brink schoolhouse, 3 miles east of, T road south	29 52 44.29	95 37 58.37	2,305
Brink schoolhouse, 3.4 miles east of, 180 feet west of center of wood bridge with railing, 25 feet south of center of road, 9 feet north of fence line; iron post stamped "Prim. Trav. Sta. No. 76, 1915," elevation 119.162 feet	29 52 44.36	95 37 33.01	2,233

CYPRESS QUADRANGLE—Continued.

Northeast from Cypress along public road toward Louetta.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Cypress, 0.8 mile northeast of, center of crossroads	29 58 23.15	95 41 13.33	3,726
Cypress, 1 mile northeast of, 45 feet north of center of road; small lone oak tree painted "U. S. B. M. 253"; copper nail in root, elevation 148.82 feet	29 58 26.91	95 41 00.82	1,163
Cypress, 0.8 mile north, and 1.85 miles east of, about the center of public road; oak tree painted "U. S. B. M. 254"; copper nail in root, elevation 148.72 feet	29 58 47.20	95 40 00.21	5,712
Cypress, 1 mile north, and 2.5 miles east of, in open prairie, 35 feet south and 10 feet west of public crossroads; iron post stamped "Prim. Trav. Sta. No. 115, 1915," elevation 148.215 feet	29 59 03.37	95 39 24.61	3,532
Cypress, 1.65 miles north and 3 miles east of, 10 feet north of road; oak tree painted "U. S. B. M. 255"; copper nail in root, elevation 146.62 feet	29 59 34.32	95 38 52.43	4,218

Along highways in northern part of quadrangle.

Cypress, 1.80 miles north of; T road north	29 59 48.70	95 41 50.58	.....
Cypress, about 1.60 miles north of, 900 feet south of T road south, 30 feet west of center of road; 1 foot east of fence post painted "U. S. B. M. 213"; copper nail in hub, elevation 153.36 feet	29 59 38.83	95 41 57.44	1,162
Cypress, 0.70 mile north of, 30 feet west of center of road; 6 inches south of large corner fence post painted "U. S. B. M. 214"; copper nail in hub, elevation 151.62 feet	29 58 51.40	95 41 56.85	4,792
Cypress, 140 feet east of station, 50 feet north of center of track, 20 feet south of center of road, 3 feet west of telephone pole, 3 feet north of fence line; iron post stamped "Prim. Trav. Sta. No. 56, 1915," elevation 150.275 feet	29 58 08.21	95 41 52.05	4,384

Magnetic declination in quadrangle, 8° 45′ E.

DEEPWATER QUADRANGLE.

Along highways in north half of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Deer Park, 0.9 mile west of, 250 feet southeast of bungalow, on north side of road; 1 foot from fence post painted "U. S. B. M. B."; copper nail in hub, elevation 36.1[illegible] feet	29 42 41.49	95 08 21.28	.....
Deepwater, about 0.9 mile east of, 40[illegible] feet east of two-story house, on north side of road; 1 foot from fence post painted "U. S. B. M. C"; copper nail in hub, elevation 37.49 feet	29 42 42.80	95 09 12.36	4,507
Deepwater station, 320 feet west of, 50 feet north of center of track, 28 feet south and 40 feet west of intersection of roads, about 4 feet from telephone pole; iron post stamped "Prim. Trav. Sta. No. 1, 1915," elevation 38.967 feet	29 42 43.96	95 10 17.90	5,779
Deepwater, about 0.75 mile west of, 140 feet west of private T road north; 2 feet from telephone pole painted "U. S. B. M. No. 1," in hub; copper nail and washer, elevation 35.76 feet	29 42 45.14	95 11 01.93	3,884
Pasadena, 0.75 mile east of, 65 feet northwest of public crossing Southern Pacific R. R., 2 feet from telephone pole painted "U. S. B. M. No. 2," in hub; copper nail, elevation 33.12 feet	29 42 43.56	95 11 56.05	4,774
Pasadena, 300 feet west of railroad station, 56 feet north of railroad track, about 5 feet from telephone pole; iron post stamped "Prim. Trav. Sta. No. 2, 1915," elevation 31.489 feet	29 42 39.82	95 12 36.93	3,625
Pasadena, about 1.1 miles west of, 20 feet east of crossroads, 2 feet from telephone pole painted "U. S. B. M. No. 3," in hub; copper nail, elevation 32.81 feet	29 42 33.86	95 13 41.34	5,711
Pasadena, 2.2 miles west of, about 350 feet east of road crossing Southern Pacific R. R., at El Buey flag station, 60 feet east of small station shelter; 6 inches from telephone pole painted "U. S. B. M. No. 4;" hub with copper nail and washer, elevation 35.07 feet	29 42 28.49	95 14 43.47	5,504

DEEPWATER QUADRANGLE—Continued.

Along highways and interurban railway in south half of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Genoa, 0.4 mile north by 1.7 miles west of interurban station, 30 feet north of center of road, 75 feet west of corner of house, 2 feet from gate post painted "U. S. B. M. No. 53"; copper nail in hub, elevation 47.82 feet	29 37 37.99	95 14 38.08	.....
Genoa, 0.4 mile north by 0.8 mile west of station on interurban railway, 25 feet north of center of road, at southeast corner of yard fence at residence painted "U. S. B. M. 54"; copper nail in hub, elevation 42.77 feet	29 37 39.06	95 13 47.35	4,479
Genoa, 0.5 mile northwest of interurban station, road crossing interurban railway; top of rail, elevation 50 feet	29 37 39.60	95 13 14.84	2,870
Genoa, 0.8 mile east of Galveston, Houston & Henderson R. R. station, 1,200 feet west of right angle in road, 25 feet south of road; copper nail in hub, witness stake painted "U. S. B. M. No. 56," elevation 46.03 feet	29 37 35.44	95 11 10.00	.....
Genoa station, about 1.4 miles east and 0.25 mile north of, about 0.4 mile east of right angle in road, 80 feet north of center of east and west road, 1 foot west of north and south fence; iron post stamped "Prim. Trav. Sta. No. 28, 1915," elevation 43.479 feet	29 37 49.62	95 10 30.77	3,747
Genoa station, about 2.3 miles east and 0.25 mile north of, 25 feet north of center of road, on small knoll; copper nail in hub, with witness stake painted "U. S. B. M. No. 57," elevation 41.60 feet	29 37 50.38	95 09 35.74	4,858
Genoa station, 3.2 miles east by 0.3 mile north of, about 900 feet west of end of road at north and south wire fence, 25 feet north of center of road; copper nail in hub, witness stake painted "U. S. B. M. No. 58," elevation 38.80 feet	29 37 51.63	95 08 42.98	4,658
Genoa station, 4 miles east by 0.4 mile north of, 1 mile west of Middle Bayou, 25 feet north of center of untraveled road; iron post stamped "Prim. Trav. Sta. No. 29, 1915," elevation 30.419 feet	29 37 59.45	95 07 53.21	4,463
Deer Park, about 3 miles south and 0.3 mile west of, 30 feet north and 30 feet west of intersection of Red Bluff road and Main Street and La Porte road; 2 feet from corner fence post painted "U. S. B. M. No. 62"; copper nail in hub, elevation 33.73 feet	29 39 48.16	95 07 57.94	.....

Along highways in western part of northeast quarter of quadrangle.

Deepwater, 0.85 mile north of, 45 feet west of road, in pasture; in root of cottonwood tree painted "U. S. B. M. 414"; copper nail, elevation, 34.64 feet	29 43 29.12	95 10 19.13	.....
Deepwater, 1.8 miles north of, 40 feet west of road, at north end of gateway leading to old pump house; 6 inches east of gatepost painted "U. S. B. M. 415"; copper nail in hub, elevation 26.90 feet	29 44 18.87	95 10 20.21	5,062
Deepwater, 2 miles north and 0.9 mile east of, 20 feet east of center of road at angle in road, in root of oak tree painted "U. S. B. M. 416"; copper nail, elevation 5.50 feet	29 44 09.24	95 09 35.89	4,026
Penn City Ferry, 575 feet west of, on north side of Buffalo Bayou, 75 feet from bank, in open pasture, U. S. Corps of Engineers permanent bench mark (their station 79+642); a concrete monument 6 inches square, with a bronze tablet marked "U. S. Eng. Dept.," in top of, elevation 16.950 feet	29 44 25.84	95 09 23.70	1,990
Penn City ferry, about 0.7 mile north of, 30 feet east of road at northwest corner of yard around two-story brick schoolhouse; chiseled square on top of concrete monmuent post painted "U. S. B. M. 417," elevation 35.49 feet	29 44 57.92	95 09 18.52	3,273

Spur line down ship channel. (Checked.)

These bench marks are probably all bronze tablets marked "U. S. Engineer Department," set in top of concrete posts, 6 inches square on top and protruding above ground. The letters R and L of the descriptions refer to right and left bank going downstream and the distances given are probably the approximate distances from the bank.			
Station 107+526, 300 R, elevation 21.797 feet	.....	.....	.....
Station 107+331, 300 R, elevation 16.006 feet	.....	.....	.....
Station 104+691, 300 R, elevation 12.316 feet	.....	.....	.....
Station 94+267, 300 R, elevation 15.094 feet	.....	.....	.....
Station 93+460, 300 R, elevation 9.338 feet	.....	.....	.....
Station 92+769, 300 R, elevation 14.986 feet	.....	.....	.....
Station 91+947, 300 R, elevation 14.571 feet	.....	.....	.....
Station 91+190, 300 R, elevation 14.138 feet	.....	.....	.....
Station 90+270, 300 R, elevation 10.930 feet	.....	.....	.....

DEEPWATER QUADRANGLE—Continued.

Spur line down ship channel—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
Bench marks—Continued.	° ′ ″	° ′ ″	*Feet.*
Station 89+186, 300 R, elevation 9.109 feet			
Station 88+010, 300 R, elevation 12.503 feet			
Station 87+310, 300 R, elevation 8.644 feet			
Station 86+459, 300 R, elevation 14.098 feet			
Station 85+209, 300 R, elevation 11.858 feet			
Station 84+608, 250 R, elevation 11.296 feet			
Station 84+042, 250 R, elevation 9.670 feet			
Station 114+685, 300 L, elevation 12.856 feet			
Station 113+791, 300 L, elevation 8.804 feet			
Station 112+730, 300 L, elevation 10.248 feet			
Station 111+230, 300 L, elevation 17.341 feet			
Station 110+404, 300 L, elevation 11.956 feet			
Station 109+500, 300 L, elevation 15.446 feet			
Station 108+491, 300 L, elevation 11.696 feet			
Station 107+526, 300 L, elevation 16.103 feet			
Station 104+691, 300 L, elevation 17.941 feet			
Station 103+231, 300 L, elevation 23.992 feet			
Station 102+051, 300 L, elevation 12.368 feet			
Station 101+295, 300 L, elevation 12.278 feet			
Station 100+133, 300 L, elevation 19.973 feet			
Station 99+299, 300 L, elevation 9.198 feet			
Station 98+223, 200 L, elevation 9.032 feet			
Station 96+864, 300 L, elevation 16.292 feet			
Station 89+186, 300 L, elevation 17.322 feet			
Station 89+453, 300 L, elevation 12.227 feet			
Station 88+010, 300 L, elevation 10.854 feet			
Station 87+310, 300 L, elevation 9.119 feet			
Station 86+459, 300 L, elevation 14.098 feet			
Station 86+209, 300 L, elevation 11.931 feet			
Station 85+209, 300 L, elevation 7.592 feet			
Station 84+608, 300 L, elevation 9.047 feet			
Station 84+496, 400 L, elevation 10.082 feet			
Station 84+042, 400 L, elevation 8.517 feet			
Station 82+042, 400 L, elevation 4.808 feet			
Station 80+036, 400 L, elevation 19.388 feet			
Station 79+642, 400 L, Penn City Ferry, 575 feet west of, on north side of Buffalo Bayou, 75 feet from bank, in open pasture, top of concrete monument 6 inches square, bronze tablet marked "U. S. Engr. Dept.", elevation 16.950 feet			
Station 78+142, 300 L, elevation 10.093 feet	29 44 13.90	95 09 13.54	
Station 77+910, 300 L, elevation 8.659 feet	29 44 12.75	95 09 12.42	152
Station 76+919, 300 L, elevation 7.374 feet	29 44 09.88	95 09 03.44	843
Station 76+146, 300 L, elevation 4.928 feet	29 44 10.54	95 08 55.50	703
Station 74+646, 300 L, elevation 2.844 feet	29 44 11.97	95 08 38.56	1,500
Station 73+612, 300 L, elevation 2.640 feet	29 44 12.95	95 08 26.89	1,034
Station 72+553, 300 L, elevation 5.020 feet	29 44 11.84	95 08 13.71	1,167
Station 71+776, 300 L, elevation 7.076 feet	29 44 08.31	95 08 04.86	860
Station 71+003, 300 L, elevation 6.834 feet			
Station 70+553, 300 L, elevation 9.356 feet	29 44 02.37	95 07 53.51	1,167
Station 70+083, 300 L, elevation 9.572 feet	29 44 01.18	95 07 49.04	413
Station 69+786, 300 L, elevation 9.694 feet	29 44 00.59	95 07 45.74	297
Station 68+965, 300 L, elevation 5.994 feet			
Harrisburg, 4.25 miles southeast of, on the right of way of the Galveston, Houston & Henderson R. R., 120 feet northwest of mile board 10, on steel and concrete bridge, 6 feet northeast of the tracks, in the center of the horizontal surface of the north abutment; copper bolt (Coast anl Geodetic Survey bench mark "P8"), elevation 38.287 feet			
Genoa, 3.25 miles northwest of, 27 feet southwest of mile board 11, on range with the telegraph poles outside of the right-of-way fence; bottom of hole in top of stone post; (Coast and Geodetic Survey bench mark "Q8"), elevation 37.212 feet			
Genoa, 2.25 miles northwest of, on the right of way of the Galveston, Houston & Henderson R. R., 65 feet southeast of mile board 12 and 50 feet southwest of the tracks; cross on top of section rail (Coast and Geodetic Survey bench mark "M. M. 12"), elevation 41.306 feet			

Magnetic declination of quadrangle, 7° 18′ E.; in northwest quarter, 8° 14′ E.

FAUNA QUADRANGLE.

Along highways near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Carpenters Bayou, 1.1 miles east of, 280 feet west of T road north, 25 feet north of road; in root of oak tree painted "U. S. B. M. 390"; copper nail, elevation 33.02 feet	29 46 18.10	95 07 30.69	.....
Bridge over small creek; center of floor, elevation 20.6 feet	.....	.....	.....
Carpenters Bayou, 1,000 feet east of crossing, about 20 feet north of road; in root of oak tree, painted "U. S. B. M. 391"; copper nail, elevation 28.00 feet	29 46 16.72	95 08 24.57	4,751
Carpenters Bayou Bridge, floor of; elevation 2.03 feet	.....	.....	.....
Carpenters Bayou, 3,450 feet west of, 25 feet north of road; iron post stamped "Prim. Trav. Sta. No. 168, 1915," elevation 25.315 feet	29 46 16.30	95 09 13.63	4,323
Carpenters Bayou, 1.55 miles west of, 20 feet south of center of road; in root of oak tree painted "U. S. B. M. 392"; copper nail, elevation 34.03 feet	29 46 14.70	95 10 07.68	4,767
Greens Bayou, 0.7 mile east of lower ferry, 25 feet north of center of road, opposite a cabin, in root of oak tree painted "U. S. B. M. 393"; copper nail, elevation 32.58 feet	29 46 14.14	95 10 55.85	4,246
Greens Bayou, 600 feet west of lower ferry, 20 feet south of road; iron post stamped "Prim. Trav. Sta. No. 169, 1915," elevation 26.888 feet	29 46 07.11	95 11 35.33	3,552
Greens Bayou, 1 mile west of lower ferry, 15 feet north of center of road, in root of pine tree painted "U. S. B. M. 394"; copper nail, elevation 36 feet	29 46 02.36	95 12 26.69	4,551
Greens Bayou, 1.9 miles west of lower ferry across, 400 feet east of small creek, 35 feet south of center of road; in root of pine tree painted "U. S. B. M. 395"; copper nail, elevation 28.49 feet	29 45 59.31	95 13 21.00	4,797
Greens Bayou, about 2.3 miles west of lower ferry, 45 feet south of center of road, at edge of timber; in root of small oak tree painted "U. S. B. M. 396"; copper nail, elevation 33.63 feet	29 46 02.42	95 13 43.49	2,007
Greens Bayou, about 2.7 miles west of lower ferry, 25 feet north of center of road, 6 feet east of corner fence post; iron post stamped "Prim. Trav. Sta. No. 170, 1915," elevation 36.297 feet	29 46 02.74	95 14 11.72	2,489
Penn City Ferry, about 1.7 miles north of, 30 feet west of center of road at edge of woods; in root of oak tree painted "U. S. B. M. 418"; copper nail, elevation 35.92 feet	29 45 49.20	95 09 20.74	.....

Along public road beside Texas & New Orleans Railroad from Sheldon toward Houston.

Sheldon, 3,000 feet southwest of, 500 feet northeast of a road south, 25 feet northwest of center of road, 30 feet southwest of milepost 346, between fence post and telephone pole; painted "U. S. B. M. 345"; wire nail in hub, elevation 47.20 feet	29 52 05.89	95 07 36.83	.....
Sheldon, 6,000 feet southwest of, 840 feet southwest of culvert, 35 feet southeast of center of road, 2 feet from wire fence; iron post stamped "Prim. Trav. Sta. No. 150, 1915," elevation 45.418 feet	29 51 51.76	95 08 08.21	3,109
Sheldon, 2.25 miles southwest of, 25 feet northwest of center of road, in stump of old telephone pole; 1 foot east of pole painted "U. S. B. M. 346"; wire nail, elevation 46.71 feet	29 51 30.60	95 08 58.83	4,943
Sheldon, 3.2 miles southwest of, opposite east end of trestle 349A on Texas & New Orleans R. R., 30 feet northeast of end of highway bridge, 25 feet from center of road, in stump of old telephone pole, 2 feet from standing pole painted "U. S. M. B. 347"; wire nail, elevation 43.67 feet	29 51 05.73	95 09 56.65	5,678

Along public road beside Texas & New Orleans Railroad from Sheldon toward Houston.

Fauna flag station, Texas & New Orleans R. R., 0.3 mile northeast of, nearly opposite a residence on southeast side of road, 30 feet northwest of center of road, 5 feet from telephone pole; iron post stamped "Prim. Trav. Sta. No. 151, 1915," elevation 46.674 feeet.	29 50 50.71	95 10 31.83	3,449
Fauna, 0.5 mile southwest of, 45 feet south of road; large pine tree painted "U. S. B. M. 363"; copper nail in root, elevation 44.01 feet	29 50 30.65	95 11 16.27	4,408
Fauna, 1.5 miles southwest of, 80 feet south of mile post 351, 45 feet south of center of road; live-oak tree painted "U. S. B. M. 364"; copper nail in root, elevation 42.06 feet	29 50 09.69	95 12 05.40	4,817

FAUNA QUADRANGLE—Continued.

Along public road beside Texas & New Orleans Railroad from Sheldon toward Houston—Contd.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Fauna, 2.25 miles southwest of, 1.1 miles northeast of Greens Bayou Bridge, 30 feet south of road, 3 feet from fence; 13 feet west of pine tree painted "U. S. P. B. M."; iron post stamped "Prim. Trav. Sta. No. 156, 1915," elevation 42.762 feet	29 49 51.93	95 12 47.20	4,090
Greens Bayou Bridge, 700 feet northeast of center of, 30 feet south of road; concrete abutment of drain pipe, painted "U. S. B. M. 365"; chiseled square on north end of, elevation 36.93 feet	29 49 29.50	95 13 39.31	5,119
Green's crossing, 550 feet northeast of, 45 feet north of T road south; 6 inches from fence post painted "U. S. B. M. 366"; copper nail in hub, elevation 43.12 feet	29 49 10.05	95 14 26.26	4,580
South from Green's crossing.			
Green's crossing, 1.1 miles south and 0.1 mile west of, 35 feet west of road, pine tree painted "U. S. B. M. 412"; copper nail in root, elevation 42.77 feet	29 48 16.40	95 14 26.05	5,418
Green's crossing, 1.8 miles south and 0.6 mile west of, 50 feet north of road and 75 feet east of small house, 8 feet east of gate and wooden bridge over road ditch; small oak tree painted "U. S. B. M. 411;" copper nail in root, elevation 39.16 feet	29 47 40.13	95 14 55.13	4,470
Greens, top of rail nearest signboard, elevation 47.9 feet			
Unchecked spur line north from Fauna.			
Fauna, opposite station, top of nearest rail, elevation 49.6 feet			
Fauna, about 0.5 mile west and 900 feet north of; pine tree standing alone in open prairie, about 1,800 feet northwest of railroad crossing, painted "U. S. B. M. 419"; copper nail in root, elevation 45.66 feet	29 50 52.53	95 11 19.48	
Fauna, 1 mile west and about 0.8 mile north of, along woods road, just north of a small clearing, 15 feet west of road; pine tree painted "U. S. B. M. 420"; copper nail in root, elevation 50.24 feet	29 51 25.40	95 11 50.85	4,320
Fauna, 1.5 miles north and 1.25 miles west of, along woods road, 3 feet west of wagon track; pine tree painted "U. S. B. M. 421"; copper nail in root, elevation 52.41 feet	29 52 05.32	95 12 05.91	4,245
Fauna, 1.9 miles north and 1.1 miles west of, in small farm clearing, 160 feet east of a cabin, 100 feet southeast of well and 2 feet north of wire fence line; iron post stamped "Prim. Trav. Sta. No. 177, 1915," elevation 52.623 feet	29 52 23.60	95 11 53.45	2.148
Along east border of quadrangle.			
Sheldon, 3,500 feet southwest of, at T road south, on southwest corner of wooden culvert, in plank; copper nail painted "U. S. 47.3 B. M.," elevation 47.43			
Sheldon, 0.6 mile west and 0.3 mile south of, T road south	29 52 03.62	95 07 41.65	
Sheldon, 0.6 mile west and 1.25 miles south of, 50 feet south of bridge over old irrigation canal, 25 feet east of road, 1 foot west of gatepost at north end of gate painted "U. S. B. M. 409"; copper nail in hub, elevation 44.55 feet	29 51 12.55	95 07 40.49	5,162
Sheldon, 0.6 mile west and 2.1 miles south of, 25 feet west of road, in line with fence east, private road east along fence, 4 feet east of fence, iron post stamped "Prim. Trav. Sta. No. 176, 1915", elevation 45.672 feet	29 50 27.76	95 07 40.16	4,525
Sheldon, 0.6 mile west and 3.2 miles south of, 35 feet west of road, 15 feet north of a fence line east; oak tree painted "U. S. B. M. 408"; one of a group of four trees; copper nail in root, elevation 46.74 feet	29 49 32.85	95 07 39.15	5,550
Sheldon, 0.55 mile west and 3.6 miles south of; center of crossroads.	29 49 13.06	95 07 38.12	2,000
Sheldon, 0.5 mile west and 4.2 miles south of, about 290 feet west of road, in small grove of trees, about 200 feet south of small wooden bridge; gum tree painted "U. S. B. M. 407"; copper nail in root, elevation 41.25 feet	29 48 38.75	95 07 34.99	3,477

Magnetic declination for north half of quadrangle, 8° 30′ E.; for east side, 8° 15′ E.; for south side, 8° 20′ E.

HARMASTON QUADRANGLE.

Along public highways between Humble and Huffman.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Humble, 2.25 miles south and 1.5 miles east of, 1.75 miles northeast of forks of road, on east end of concrete culvert, painted "U. S. B. M. 327"; hollow square chiseled in concrete, elevation 75.32 feet	29 57 54.09	95 14 25.22	.....
Humble, 1.75 miles south and 2.15 miles east of, 80 feet east of concrete culvert at angle of road, 20 feet south of center of road; pine tree painted "U. S. B. M. 328"; copper nail in root, elevation 79.27 feet	29 58 20.96	95 13 45.84	4,401
Humble, 1.25 miles south and 3 miles east of, 1,000 feet west of angle in road, 20 feet north of road in line with telephone poles; iron post stamped "Prim. Trav. Sta. No. 142, 1915", elevation 76.077 feet	29 58 47.83	95 12 57.03	5,078
Humble, 0.9 mile south and 3.8 miles east of, 20 feet south of road, oak tree painted "U. S. B. M. 329"; copper nail in root, elevation 70.82 feet	29 59 05.36	95 12 09.15	4,568
Humble, 0.6 mile south and 4.6 miles east of, 37 feet north of road: pine tree painted "U. S. B. M. 330"; copper nail in root, elevation 71.74 feet	29 59 22.98	95 11 18.28	4,815
Humble, 5.25 miles east of, 125 feet east of a road north to oil derrick, 20 feet south of center of road; iron post stamped "Prim. Trav. Sta. No. 143, 1915", elevation 69.515 feet	29 59 35.44	95 10 38.89	3,684
Humble, 6.15 miles east of, just east of a bend in road, 25 feet north of road; pine tree painted "U. S. B. M. 331"; copper nail in root, elevation 66.98 feet	29 59 52.52	95 09 45.18	5,027
Humble, 7 miles east of, ½ mile west of house on south side of road, 25 feet north of road; oak tree painted "U. S. B. M. 332"; copper nail in root, elevation 59.04 feet	29 59 51.24	95 08 51.78	4,700
Humble, 7.7 miles east of, 0.5 mile west of San Jacinto River, 25 feet north of road; iron post stamped "Prim. Trav. Sta. No. 144, 1915," elevation 40.186 feet	29 59 49.08	95 08 09.85	3,694
Huffman, 1.9 miles south and 2.5 miles west of, 750 feet east of ferry across San Jacinto River, 50 feet south of road; gum tree painted "U. S. B. M. 333"; copper nail in root, elevation 30.38 feet	29 59 50.28	95 07 32.43	3,292

Along second-class road between Sheldon and Victor.

Sheldon, 0.6 mile north by 0.6 mile west of, 50 feet south of road, on top of old trail pump, copper nail; painted "U. S. 51.7 B. M.," elevation 51.87 feet	.....	.....	.....
Sheldon, 0.7 mile north and 0.7 mile west of, 10 feet south of a winding woods road; elm tree painted "U. S. B. M. 349"; wire nail in root; not found in 1916	29 52 54.88	95 07 46.39	.....
Sheldon, 0.7 mile north and 1.1 miles west of, 600 feet east of a fenced clearing on a newly cleared right of way for road; gum tree painted "U. S. B. M. 350"; wire nail in root, elevation 50.38 feet	29 53 00.67	95 08 14.97	2,588
Sheldon, 0.9 mile north and 1.7 miles west of, 15 feet north of a cleared east and west right of way for road; iron post stamped "Prim. Trav. Sta. No. 152, 1915," elevation 55.628 feet	29 53 08.71	95 08 49.97	3,187
Sheldon, 0.8 mile north and 2.4 miles west of, 500 feet east of a greenhouse, 4 feet south of an east and west wire fence; gum tree (one of a group) painted "U. S. B. M. 351"; wire nail in root, elevation 52.67 feet	29 53 00.22	95 09 30.66	3,683
Sheldon, 1.4 miles north and 2.8 miles west of, 30 feet west of prairie road; gum tree painted "U. S. B. M. 352"; wire nail in root, elevation 54.18 feet	29 53 35.15	95 09 57.04	4,225
Sheldon, 2.3 miles north and 3.5 miles west of, 700 feet northwest of bend in road, 1,200 feet southeast of edge of woods, 25 feet northeast of road, near small group of pine trees; iron post stamped "Prim. Trav. Sta. No. 153, 1915," elevation 56.818 feet	29 54 22.74	95 10 39.29	6,078
Victor, 0.9 mile south and 1.2 miles east of, 55 feet southwest of road at edge of prairie and timber; pine tree painted "U. S. B. M. 353;" wire nail in root, elevation 56.77 feet	29 54 53.40	95 11 24.32	5,030
Victor, 0.6 mile south and 0.7 mile east of, 55 feet north of road; large oak tree painted "U. S. B. M. 354"; wire nail in root, elevation 54.67 feet	29 55 08.84	95 11 54.55	3,085
Victor siding, Beaumont, Sour Lake & Western Ry, 470 feet northeast of road crossing, 55 feet southeast of track, opposite siding sign post, 2 feet from fence line; iron post stamped "Prim. Trav. Sta. No. 154, 1915," elevation 57.424 feet	29 55 39.22	95 12 37.16	4,847

HARMASTON QUADRANGLE—Continued.

Along Beaumont, Sour Lake & Western Railway from Victor to Harmaston.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Victor, 1 mile northeast of, 40 feet southeast of center of track; 8 inches from telegraph pole painted "U. S. B. M. 355"; wire nail in hub, elevation 58.27 feet	29 56 15.01	95 12 00.35	4,854
Victor, 1.9 miles northeast of, 40 feet southeast of center of track; 1 foot from telegraph pole painted "U. S. B. M. 356;" wire nail in hub, elevation 59.51 feet	29 56 50.53	95 11 23.74	4,821
Spencer, opposite signpost, top of rail, elevation 64.6 feet			
Victor, 2.8 miles northeast of, 50 feet northwest of center of track; hickory tree painted "U. S. B. M. 357"; wire nail in root, elevation 63.01 feet	29 57 25.71	95 10 48.88	4,694
Victor, 3.7 miles northeast of, 50 feet southeast of center of track; oak tree painted "U. S. B. M. 358"; wire nail in root, elevation 66.75 feet	29 57 59.29	95 10 12.65	4,654
Harmaston, 660 feet northeast of signboard, 40 feet southeast of center of track, near road crossing, 10 feet from corner of fence at section house, 2½ feet from telegraph pole; iron post stamped "Prim. Trav. Sta. No. 155, 1915," elevation 68.919 feet	29 58 37.37	95 09 33.53	5,161
Harmaston, 1 mile northeast of, 38 feet southeast of center of track, 8 inches from telegraph pole painted "U. S. B. M. 359"; copper nail in hub, elevation 55.24 feet	29 59 10.93	95 08 47.20	5,300
Trestle 336–5, middle of, top of rail, elevation 50.4 feet			
Harmaston, 2.1 miles northeast of, 15 feet southwest of southwest corner of trestle, 10 feet from center of track; in top of square post beside warning sign post painted "U. S. B. M. 360"; copper nail, elevation 48.63 feet	29 59 36.94	95 07 50.29	5,653
Near southwest corner of quadrangle.			
Dyersdale station, Beaumont, Sour Lake & Western Ry., about 500 feet south of, 70 feet east and 20 feet south of public-road crossing; iron post stamped "Prim. Trav. Sta. No. 161, 1915," elevation 56.972 feet	29 53 29.47	95 14 50.70	
Dyersdale station, 800 feet south and ½ mile east of; oak tree painted "U. S. B. M. 413"; copper nail in root (not found, 1916)	29 53 25.61	95 14 19.23	2,797

Magnetic declination for quadrangle, 8° 30′ E.

HILLENDAHL QUADRANGLE.

Along Washington road.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Fairbanks, 2.1 miles northwest of, 65 feet east of railroad crossing, 25 feet south of road, 2 feet from corner fence post; copper nail in hub, t. b. m. 137, elevation 103.16 feet	29 52 01.74	95 33 08.84	
Fairbanks, 1.2 miles northwest of, 230 feet east of milepost 14, 60 feet north of railroad, 20 feet south of road; 1 foot from telephone pole painted "U. S. B. M. 138"; copper nail in hub, elevation 99.51 feet	29 51 32.61	95 32 27.48	4,683
Fairbanks station (Houston & Texas Central R. R.), about 350 feet northwest of, 35 feet north of public road, 50 feet south of store and post office, 2 feet from telephone pole; iron post stamped "Prim. Trav. Sta. 66, 1915," elevation, 96.113 feet	29 50 53.01	95 31 30.84	6,393
Fairbanks, about 0.8 mile southeast of, 500 feet east of milepost 12, 25 feet south of center of road; 6 inches from telephone pole painted "U. S. B. M. 139"; copper nail in hub, elevation 92.86 feet	29 50 24.10	95 30 51.06	4,561
Fairbanks, about 1.6 miles southeast of, 150 feet northwest of milepost 11, 65 feet east of railroad crossing, 25 feet south of road; 6 inches from telephone pole painted "U. S. B. M. 140"; copper nail in hub, elevation 87.00 feet	29 49 57.54	95 30 13.71	4,245

HILLENDAHL QUADRANGLE—Continued.

Along Jeanetta-Hillendahl road.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Hillendahl, 1 mile east by 2.2 miles south of, about 0.7 mile northeast of Buffalo Bayou bridge, 60 feet east of angle in road; copper nail in root of oak tree in edge of timber, tree painted "U. S. B. M. 150," elevation 71.59 feet	29 45 02.65	95 31 01.92	.....
Hillendahl, 1 mile east by 1.2 miles south of, 30 feet east of center of north and south road, 2.5 feet southwest of corner fence post, timber on both sides of road; iron post stamped "Prim. Trav. Sta. No. 70, 1915," elevation 80.655 feet	29 45 57.90	95 31 01.98	5,580
Hillendahl, 1 mile east of, 65 feet northeast of intersection of main shell road and railroad track, 50 feet north of track, in line with right-of-way fence; iron post with 3-inch cap (not stamped) is a Coast and Geodetic Survey bench mark; also "Prim. Trav. Sta. No. 71, 1915," elevation 78.628 feet	29 47 03.71	95 30 48.91	6,748
Along Hillendahl-Fairbanks road.			
Hillendahl, 0.9 mile north and 1 mile east of, 6 inches from corner fence post, painted "U. S. B. M. 160"; copper nail in hub, elevation 83.62 feet	29 47 51.07	95 30 55.19	4,817
Hillendahl, 1.3 miles north and 1.8 miles east of, 30 feet north of center of east and west road; in root of oak tree painted "U. S. B. M. 161"; copper nail, elevation 83.99 feet	29 48 10.14	95 30 06.68	4,687
Along Missouri, Kansas & Texas Railway.			
Addicks, 1.5 miles east of, 240 feet east of T road north, 20 feet south of public road, 50 feet north of Missouri, Kansas & Texas Ry.; iron post stamped "Prim. Trav. Sta. No. 73, 1915," elevation 91.600 feet	29 47 05.83	95 36 58.66	.....
Addicks, about 2 miles east of, 20 feet north of road; in root of oak tree close to fence line; copper nail, tree painted "U. S. B. M. 154," elevation 86.39 feet	29 47 06.17	95 36 33.90	2,182
Addicks, about 2.4 miles east of, 75 feet north of road crossing Missouri, Kansas & Texas Ry.; T road south	29 47 05.74	95 36 07.80	2,300
Addicks, about 2.8 miles east of, 25 feet south of road; 6 inches from telephone pole painted "U. S. B. M. 155"; copper nail in hub, elevation 93.11 feet	29 47 05.46	95 35 42.49	2,230
Addicks, about 3.7 miles east of, 25 feet south of road; 6 inches from telephone pole painted "U. S. B. M. 156"; copper nail in hub, elevation 93.24 feet	29 47 05.15	95 34 48.07	4,796
Along public road.			
Hillendahl, 2 miles west of, 820 feet east of mileboard 1071, 75 feet west of small bridge, 2.5 feet south of telephone pole; copper nail in hub under wire fence, pole painted "U. S. B. M. 157," elevation 81.92 feet	29 47 04.81	95 33 55.02	4,675
Hillendahl, 1.3 miles west of, 25 feet south of public road, 400 feet east of mileboard 1072, 6 inches from telephone pole painted "U. S. B. M. 158"; copper nail in hub, elevation 88.11 feet	29 47 04.51	95 33 00.24	4,827
Hillendahl, 0.7 mile west of, on top of center of north end of concrete culvert; chiseled square (probably a Coast and Geodetic Survey bench mark), elevation 87.073 feet	29 47 04.00	95 32 24.32	3,165
Hillendahl, 0.3 mile east of, 30 feet south of road, 6 inches from telephone pole painted "U. S. B. M. 159"; copper nail in hub, elevation 83.02 feet	29 47 03.89	95 31 32.36	4,579
Hillendahl, 0.9 mile east of, T road south; top of rail at crossing, elevation 82.7 feet	.....	.....	.....
Along wagon road in northeast corner of quadrangle.			
Fairbanks, 1.25 miles north and 1 mile east of, 20 feet north of east-and-west road and 25 feet east of road north, 6 inches from corner fence post; copper nail in hub, "T. B. M. 284," elevation 94.13 feet	29 51 55.6	95 30 24.1	4,787
Fairbanks, 3,500 feet north and 0.5 mile east of, 4,500 feet N. 30° E. from water tank, 125 feet south of small creek in open prairie; copper nail in hub, "T. B. M. 285," elevation 92.55 feet	29 51 23.0	95 30 54.3	4,235
Fairbanks, iron post No. 66	29 50 53.0	95 31 30.8	4,423

Magnetic declination, 8° 46′ E.

HOCKLEY QUADRANGLE.

From point near Hockley southeast along highway to southeast corner of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Hockley, 1.7 miles west by 0.4 mile south of, 150 feet southwest of white house, 20 feet north by 25 feet west of T road north, 8 inches from corner fence post; copper nail in hub, post painted "U. S. B. M. 191," elevation 233.05 feet	30 01 17.55	95 52 24.63	.....
Hockley, 1.9 miles northwest of, 15 feet south by 30 feet west of intersection of roads, 6 inches from telephone pole; copper nail in hub, pole painted "U. S. B. M. 180," elevation 238.65 feet	30 02 13.50	95 52 25.71	5,653
Hockley, 1.1 miles northwest of, 120 feet south of Houston & Texas Central R. R. track, 25 feet south of center of public road, 6 inches from corner post, on fence line south; copper nail in hub, post painted "U. S. B. M. 179," elevation 227.68 feet	30 01 56.49	95 51 40.28	4,346
Hockley, 600 feet west of Houston & Texas Central R. R. station, opposite milepost 36, 105 feet south of main track, 30 feet south of center of public road; iron post stamped "Prim. Trav. Sta. No. 78, 1915," elevation 221.210 feet	30 01 36.79	95 50 48.19	4,993
Hockley depot, opposite semaphore; top of rail, elevation 223 feet	.....	.....	.....
Hockley, 1 mile southeast of, 1 foot from telephone pole opposite railroad sign "1 mile to Hockley," 25 feet south of road; copper nail in hub, pole painted "U. S. B. M. 178," elevation 213.99 feet	30 01 14.61	95 49 44.94	5,994
Hockley, 1.9 miles southeast of, 120 feet north by 20 feet west of road crossing Houston & Texas Central R. R., 25 feet north of shell road, 1 foot from telephone pole; copper nail in hub, pole painted "U. S. B. M. 110," elevation 207.91 feet	30 00 56.00	95 48 54.16	4,844
Hockley, 2.6 miles southeast of, 25 feet south of center of shell road, about 60 feet north of center of Houston & Texas Central R. R., 1 foot from telephone pole; copper nail in hub, pole painted "U. S. B. M. 111," elevation 202.94 feet	30 00 37.26	95 48 05.89	4,647
Hockley, 3.7 miles southeast of, 100 feet north of railroad track, 40 feet north of section house; copper nail in root of china berry tree, tree painted "U. S. B. M. 112," elevation 203.05 feet	30 00 15.33	95 47 05.78	5,730

Along highway north near center of south border of quadrangle.

Hockley, 1 mile south of Houston & Texas Central R. R., at a crossing 1.9 miles southeast of station, 2,400 feet north of right-angle turn in road, 30 feet east of center of roadway, 2 feet from fence post; iron post stamped "Prim. Trav. Sta. No. 53, 1915," elevation 203.814 feet	30 00 06.27	95 48 53.41	.....
Bench mark 110, described in preceding line	30 00 56.00	95 48 54.16	5,024

Along highways through center of quadrangle.

Hockley, 3.75 miles north and 1 mile west of, 25 feet south of center of road, opposite house of Charles Imhol, 3.5 feet from corner fence post; iron post stamped "Prim. Trav. Sta. No. 88, 1915," elevation 274.862 feet	30 04 53.71	95 51 57.22	.....
Hockley, 3.7 miles north and 0.2 mile west of, 30 feet north of road, 150 feet west of T road south, 8 inches from fence post; copper nail in hub, witness stake painted "U. S. B. M. 200," elevation 273.49 feet	30 04 54.48	95 51 09.39	4,202
Hockley, 3.7 miles north and 0.3 mile east of, 170 feet south of T road west, 25 feet west of center of road; in root of oak tree painted "U. S. B. M. 201;" copper nail, elevation 224.47 feet	30 04 52.81	95 50 30.05	3,461
Hockley, 2.90 miles north and one-fourth mile east of, T road east	30 04 08.08	95 50 29.30	4,521
Hockley, 2.90 miles north and 0.60 mile east of, 1,800 feet east of T road east, 25 feet north of center of road, 4 feet south of wire fence; iron post stamped "Prim. Trav. Sta. No. 89, 1915," elevation 263.880 feet	30 04 08.55	95 50 08.47	1,831
Hockley, 2.9 miles north and 1.5 miles east of, 1,550 feet west of T road south, 25 feet north of center of road, 1 foot east of corner post on fence line north; copper nail in hub painted "U. S. B. M. 202," elevation 241.74 feet	30 04 09.11	95 49 13.38	4,841
Hockley, 2.9 miles north and 2.5 miles east of, 30 feet south of center of road, 60 feet west of lane north, 1 foot from fence post painted "U. S. B. M. 203"; copper nail in hub, elevation 236.96 feet	30 04 09.19	95 48 16.63	4,988
Hockley, 2.70 miles north and 2.90 miles east of, 30 feet west of T road east, 4 feet southeast of gatepost, 2 feet from wire fence line; iron post stamped "Prim. Trav. Sta. No. 90, 1915," elevation 227.768 feet	30 03 58.92	95 47 54.63	2,193

HOCKLEY QUADRANGLE—Continued.

Along highways through center of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Hockley, 2.70 miles north and 3.80 miles east of, 700 feet west of T road west, 20 feet south of center of road, at corner fence post painted "U. S. B. M. 204"; copper nail in hub, elevation 216.46 feet	30 03 59.60	95 47 00.70	4,740
Hockley, 3 miles north and 4.2 miles east of, 25 feet south of Hockley-Rosehill road; 1 foot from east gatepost and corner post on fence line south; copper nail in hub, "U. S. B. M. 205," elevation 230.80 feet	30 04 17.82	95 46 14.70	4,442
Rosehill, 3 miles west of, on the Rosehill-Hockley road, 20 feet north of road at point where a dim road crosses north and south; 750 feet southwest of fence corner; iron post stamped "Prim. Trav. Sta. No. 91, 1915," elevation 230.891 feet	30 04 38.02	95 45 30.21	4,411

Magnetic declination for south half of quadrangle, 8° 30′ E.

HOUSTON HEIGHTS QUADRANGLE.

Along public road.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Fairbanks station, 2.4 miles southeast of, about 1,000 feet northwest of mile post 10, 40 feet north of road; 7 feet from corner fence post; iron post stamped "Prim. Trav. Sta. No. 67, 1915," elevation 81.077 feet	29 49 31.00	95 29 35.38	
Fairbanks station, 3.3 miles southeast of, 850 feet northwest of railroad crossing, 20 feet south of road; 6 inches from telephone pole painted "U. S. B. M. 141"; copper nail in hub, elevation 82.54 feet	29 49 00.38	95 28 53.73	4,798
Fairbanks, 4.2 miles southeast of, 2,100 feet northwest of milepost 8, 20 feet south of road; 6 inches from telephone pole painted "U. S. B. M. 142"; copper nail in hub, elevation 77.80 feet	29 48 31.18	95 28 13.59	4,604
Eureka, 1.75 miles northwest of, about halfway between mileposts 7 and 8, 60 feet north and 30 feet west of forks of road at T road north; 5 feet from fence corner; iron post stamped "Prim. Trav. Sta. No. 68, 1915," elevation 76.615 feet	29 48 00.83	95 27 31.21	4,831
Eureka, 0.8 mile northwest of, 125 feet east of culvert, "R. R. 6 c," 20 feet south of road; 1 foot from telephone pole painted "U. S. B. M. 143"; copper nail in hub, elevation 72.01 feet	29 47 29.44	95 26 49.06	4,883
Eureka, crossing of Missouri, Kansas & Texas Ry. and Houston & Texas Central R. R., about 84 feet east and 15 feet north of, 6 feet east of cattle guard at road crossing, 25 feet south of public road; in 3-inch by 4-inch post 4 inches above ground; copper nail; pole painted "U. S. B. M. 144," elevation 68.82 feet	29 47 01.22	95 26 10.03	4,467
Eureka, crossing of Houston & Texas Central R. R. and Missouri, Kansas & Texas Ry	29 47 01.11	95 26 10.97	85
Eureka, 480 feet east of intersection of Missouri, Kansas & Texas Ry. and Houston & Texas Central R. R. tracks, block signal at north side of Missouri, Kansas & Texas track; bottom of square hole in concrete foundation, Coast and Geodetic Survey bench mark, "H8," elevation 65.595 feet			
Eureka, 0.9 mile southeast of, 25 feet south of center of Washington Road; 6 inches from telephone pole painted "U. S. B. M. 145"; copper nail in hub, elevation 62.23 feet	29 46 27.92	95 25 34.18	4,663
Houston, city limits on Washington Avenue, about 0.5 mile west of, 530 feet west of Birdsall Avenue, 30 feet north of center of road, 5 feet east of corner fence post; 8 feet from telephone pole; iron post stamped "Prim. Trav. Sta. No. 69, 1915," elevation 60.259 feet	29 46 14.98	95 25 18.25	1,918
Houston, intersection of Bruner Avenue and Houston & Texas Central R. R. track; top of rail, elevation 63.2 feet			
Houston city limits, at center of Washington Avenue	29 46 12.58	95 24 47.76	2,696
Houston, about 270 feet east of city limit, 0.4 mile south of Washington Avenue, 20 feet west of center of Roy Street; in root of oak tree 2 feet in diameter; copper nail and washer; telephone painted "U. S. B. M. 146," elevation 61.28 feet	29 45 51.34	95 24 44.35	2,168
Buffalo Bayou, center of iron truss bridge on Shepherd Dam road	29 45 37.14	95 24 31.02	1,855
Buffalo Bayou Bridge, on Shepherd Dam road, 150 feet south of south end of bridge; east end of concrete spillway; chiseled square, elevation 46.14 feet			

HOUSTON HEIGHTS QUADRANGLE—Continued.

Along public road—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Buffalo Bayou Bridge, on Shepherd Dam road, 0.4 mile southwest of, 0.8 mile north of Westheimer road, 18 feet east of center of Shepherd Dam road, 20 feet south of fence corner; 6 inches from fence post painted "U. S. B. M. 147"; copper nail in hub, elevation 60.07 feet	29 45 16.16	95 24 37.70	2,200
Hillendahl, 1.8 miles north and 2.1 miles east of, 150 feet south of house, 30 feet north of road, 30 feet east of lane north; in root of oak tree painted "U. S. B. M. 162"; copper nail, elevation 76.94 feet	29 48 09.37	95 29 05.40	.....
Hillendahl, 1.8 miles north and 2.8 miles east of, 25 feet south of center of road opposite white house; in root of mulberry tree painted "U. S. B. M. 163"; copper nail, elevation 76.42 feet	29 48 08.97	95 28 24.36	3,615
Durkee schoolhouse, 0.7 mile east of, 0.4 mile east of East Montgomery Road, 40 feet north of road; in root of lone oak tree on prairie; copper nail (t. b. m. 278), elevation 83.15 feet	29 52 11.66	95 22 40.87	4,734
Durkee schoolhouse, 0.25 mile east of, crossroads at East Montgomery Road	29 52 11.00	95 23 05.16	2,140
Durkee schoolhouse, 500 feet west of, 40 feet east and 30 feet north of crossroads; in root of poplar tree at fence line; copper nail (t. b. m. 279), elevation 83.20 feet	29 52 11.02	95 23 27.55	1,970
Durkee schoolhouse, 1.25 miles west of, 30 feet west of Houston-Steubner "air line" road, 15 feet south of T road east; iron post stamped "Prim. Trav. Sta. No. 126, 1915," elevation 88.413 feet	29 52 09.86	95 24 34.82	5,924
Durkee schoolhouse, about 1.75 miles west of, in open field about halfway between "air line" road and West Montgomery road; in root of lone persimmon tree, painted (t. b. m. 280); copper nail, elevation 85.42 feet	29 51 54.13	95 24 59.56	2,697
West Montgomery road; T road west	29 51 47.77	95 25 41.26	3,729
West Montgomery road, about 0.4 mile west of, at point 1.5 miles north of junction of "air line" and West Montgomery roads, 30 feet south of center of road and 4 feet north of fence line; iron post stamped "Prim. Trav. Sta. No. 127, 1915," elevation 91.885 feet	29 51 47.30	95 26 06.94	2,262
West Montgomery road, 1.25 miles west of, 1.8 miles east of Trinity & Brazos Valley R. R., on Fairbanks and Montgomery link road, 40 feet south of road; in root of pine tree painted "U. S. B. M. 281"; copper nail, elevation 89.18 feet	29 51 45.74	95 26 57.47	4,452
West Montgomery road, 2 miles west of, 1 mile east of Trinity & Brazos Valley R. R., on Fairbanks-Montgomery link Road, 25 feet south of road at bend; in root of oak tree painted "U. S. B. M. 282"; copper nail (t. b. m. 282), elevation 82.02 feet	29 51 46.86	95 27 45.66	4,245
T road corners, road southeast	29 51 46.70	95 28 24.25	3,398
Fairbanks, 1 mile north and 2.7 miles east of, about 930 feet south and 590 feet east of public road crossing of Trinity & Brazos Valley R. R., northeast side of road at right angle, 120 feet east of Trinity & Brazos Valley R. R.; 3 feet from corner fence post; iron post stamped "Prim. Trav. Sta. No. 128, 1915," elevation 87.049 feet	29 51 46.88	95 28 46.96	2,000
Fairbanks, 1.25 miles north and 2.25 miles east of, 1,550 feet west of Trinity & Brazos Valley R. R.; crossroads	29 51 55.98	95 29 11.25	2,329
Fairbanks, 1.2 miles north and 1.9 miles east of, 0.6 mile west of Trinity & Brazos Valley R. R.; 25 feet south of public road and 6 inches west of corner fence post; copper nail in hub (t. b. m. 283), elevation 90.56 feet	29 51 55.45	95 29 29.70	1,626

Along Missouri, Kansas & Texas Railway in southeast quarter of quadrangle.

Houston, in 1st Ward, 600 feet west of Taylor Street, 32 feet north of center of Missouri, Kansas & Texas Ry. track, 4 feet south of fence line; in root of pecan tree painted "U. S. B. M. 251"; copper nail, elevation 56.92 feet	29 46 29.76	95 22 59.94	.....
Houston, at northwest corner of city limits, 240 feet east of Oxford Street and between Tenth and Eleventh streets, Houston Heights; concrete monument, 8 inches square, with hole in top	29 47 23.43	95 23 28.14	3,339
Houston Heights, on boulevard, center of parking, 84 feet south of center of Missouri, Kansas & Texas Ry. track, midway between the two electric tracks; iron post top flush with ground; Coast and Geodetic Survey bench mark "18," "Prim. Trav. Sta. No. 114," elevation 61.017 feet	29 46 58.47	95 23 50.80	5,340
Houston, 140 feet south and 35 feet west of Brunner Avenue crossing of Missouri, Kansas & Texas Ry.; on root of oak tree painted "U. S. B. M. 252"; copper nail, elevation 58.34 feet	29 46 57.38	95 24 35.00	3,898
Houston, Missouri, Kansas & Texas Ry. trestle over White-oak Bayou; top of rail, elevation 32.4 feet	.....	.....	.....

HUFFMAN QUADRANGLE.

From southeast corner of quadrangle to Huffman.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Huffman, 1.4 miles south and 1.75 miles west of, 200 feet east of crossing of Beaumont, Sour Lake & Western Ry., 30 feet south of center of road; oak tree painted "U. S. B. M. 334"; wire nail in root, elevation 58.00 feet	30 00 13.38	95 06 50.57	.....
Huffman, 1.4 miles south and 0.9 mile west of, 0.4 mile west of T road corners, 30 feet north of center of road; oak tree painted "U. S. B. M. 335"; wire nail in root, elevation 71.32 feet	30 00 14.56	95 06 00.78	4,380
Huffman, 1.4 miles south and 0.5 mile west of, 20 feet east of T road corners, 2 feet from wire fence; iron post stamped "Prim. Trav. Sta. No. 145, 1915," elevation 70.708 feet	30 00 14.60	95 05 35.38	2,233
Huffman, 0.7 mile south and 0.5 mile west of, 300 feet south of pipe line crossing road, 20 feet east of road; gum tree painted "U. S. B. M. 442"; copper nail in root, elevation 68.92 feet	30 00 51.59	95 05 32.80	3,744
Huffman, 0.35 mile west of, road crossing Beaumont, Sour Lake & Western Ry.: top of rail, elevation 72.8 feet	.....	.....	.....
Huffman, 700 feet south and 1,600 feet west of, public road crossing Beaumont, Sour Lake & Western Railway	30 01 19.23	95 05 24.50	2,885

From Huffman north to Austin Scott's farms, near county line.

Huffman, 0.35 mile north and 0.2 mile west of, about 600 feet north of schoolhouse, 30 feet east of road, opposite dwelling house; cottonwood tree painted "U. S. B. M. 443"; copper nail in root, elevation 70.91 feet	30 01 44.51	95 05 16.87	2,637
Huffman, 1 mile north and 0.25 mile west of, 300 feet northeast of church, 20 feet west of road and 6 feet south of a fence corner; iron post stamped "Prim. Trav. Sta. No. 187, 1915," elevation 74.117 feet	30 02 22.39	95 05 21.84	3,852
Huffman, 1.2 miles north of, by 0.25 mile west of T road west, west side of north-south road, northeast corner of small wooden bridge, in plank; copper nail painted "U. S. 73.1 B. M.," elevation 73.12 feet	.....	.....	.....
Huffman, 2 miles north and 0.1 mile west of, 15 feet west of road at angle; gum tree painted "U. S. B. M. 444"; copper nail in root, elevation 74.11 feet	30 03 10.39	95 05 13.84	4,900
Huffman, 2.3 miles north and 0.5 mile east of, 70 feet north of public road in pasture, about 400 feet southeast of Mr. J. J. Simmon's house; lone oak tree painted "U. S. B. M. 445"; copper nail in root, elevation 74.99 feet	30 03 26.33	95 04 36.39	3,664
Huffman, 3.3 miles north and 0.4 mile east of, 20 feet north of dim road and 25 feet north of large oak tree painted "U. S. P. B. M."; iron post stamped "Prim. Trav. Sta. No. 188, 1915," elevation 76.155 feet	30 04 17.57	95 04 42.68	5,205
Huffman, 3.5 miles north and 0.4 mile west of, 200 feet south of ford crossing Loose Bayou, 5 feet north of road; oak tree painted "U. S. B. M. 446"; copper nail in root, elevation 50.70 feet	30 04 27.98	95 05 30.57	4,338
Huffman, 4 miles north and 0.9 mile west of, 0.9 mile northwest of Loose Bayou ford, 10 feet west of road, magnolia tree painted "U. S. B. M. 447"; copper nail in root; not found in 1916	30 04 58.33	95 06 00.66	4,049
Huffman, 4 miles north by 0.9 mile west of, 0.9 mile northwest of Loose Bayou ford, 5 feet west of road, in root of oak tree; wire nail painted erroneously "U. S. 72.9 B. M.," elevation 75.92 feet	.....	.....	.....
Huffman, 4.9 miles north and 0.9 mile west of, 15 feet south of double gate in east and west fence line, 8 feet east of road; oak tree painted "U. S. B. M. 448"; copper nail in root, elevation 79.96 feet	30 05 33.44	95 06 02.15	3,550
Huffman, 5.2 miles north and 0.9 mile west of, 0.3 mile north of double gate just east of wagon road; iron post stamped "Prim. Trav. Sta. No. 189, 1915," elevation 83.852 feet	30 05 49.76	95 06 01.07	1,652
Huffman, 6 miles north and 0.9 mile west of, 10 feet east of road; magnolia tree painted "U. S. B. M. 449"; copper nail in root, elevation 90.68 feet	30 06 33.94	95 06 01.95	4,464
Huffman, 6.7 miles north and 1.3 miles west of, 5 feet northeast of road; pine tree painted "U. S. B. M. 450"; copper nail in root, elevation 96.66 feet	30 07 07.17	95 06 23.66	3,861

From Huffman northwest on old road to Porter.

Huffman, 1.3 miles north and 1 mile west of, 5,000 feet west of gate at public road, at south side of wagon track; oak tree painted "U S. B. M. 460"; wire nail in root, elevation 70.29 feet	30 02 36.12	95 06 04.43	.....
Huffman, 1.3 miles north and 1.7 miles west of, 5 feet southwest of road, gum tree painted "U. S. B. M. 461"; copper nail in root, elevation 63.06 feet	30 02 33.68	95 06 46.90	3,740
Huffman, 1.4 miles north and 2.3 miles west of, 150 feet east of San Jacinto River, just below mouth of Loose Bayou; large gum tree painted "U. S. B. M. 462"; copper nail in root, elevation 34.08 feet	30 02 24.18	95 07 25.60	3,535

HUFFMAN QUADRANGLE—Continued.

East and north of Huffman, mostly on prairie.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Huffman, 1 mile south and 1.85 miles east of, probably just on east side of Cedar Bayou, which is here indefinite, on west side of a grove of gum trees surrounded by a group of haw trees and bushes; small gum tree painted "U. S. B. M. 490"; copper nail in root, elevation 64.98 feet	30 00 36.87	95 03 15.08	.....
Huffman, 0.2 mile south and 2.1 miles east of, 2,000 feet north of pipe line, on east side of a grove of about 100 small gum trees; one painted "U. S. B. M. 491";[a] copper nail in root, elevation 66.47 feet	30 01 15.66	95 03 00.42	4,126
Huffman, 0.6 mile north and 2.5 miles east of, on prairie near small round concrete-lined reservoir for stock-water supply, on southeast corner of concrete watering trough painted "U. S. B. M. 492;"[a] chiseled mark, elevation 71.82 feet	30 02 00.39	95 02 39.08	4,893
Huffman, 0.8 mile north and 1.8 miles east of, opposite west end of small bridge across Cedar Bayou, which is line between Harris and Liberty counties, 54 feet north of center of Beaumont, Sour Lake & Western Ry. track; elm tree painted "U. S. B. M. 493"; copper nail in root, elevation 69.71 feet	30 02 08.31	95 03 16.20	3,361
Huffman, 1 mile north and 0.75 mile east of, 100 feet north of east and west road on south side of group of gum trees, one of which is painted "U. S. B. M. 494"; copper nail in root, elevation 68.90 feet	30 02 18.63	95 04 19.73	5,682

[a] T. b. ms. 491 and 492 are in Liberty County.

Magnetic declination for quadrangle, 8° 27′ E.

WEEDEN QUADRANGLE.

Along Westfield-Humble road.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Westfield, 0.25 mile south and 1.8 miles east of, 50 feet north of center of road; lone pine tree painted "U. S. B. M. 309"; copper nail in root, elevation 95.44 feet	30 01 07.90	95 22 22.92	.....
Westfield, 0.5 mile south and 2.7 miles east of, 30 feet south of center of road, 6 feet north of fence post at angle in fence line; iron post stamped "Prim. Trav. Sta. No. 136, 1915," elevation 90.117 feet	30 00 57.53	95 21 28.97	4,857
Westfield, 0.5 mile south and 3.1 miles east of; forks of road; road southwest	30 00 53.56	95 21 04.15	2,218
Westfield, 0.6 mile south and 3.7 miles east of, 45 feet north of road, nearly north of small wooden bridge; large pine tree painted "U. S. B. M. 310"; copper nail in root, elevation 90.77 feet	30 00 47.91	95 20 29.36	3,112
Westfield, 0.8 mile south and 4.5 miles east of, 30 feet south of center of road; small oak tree painted "U. S. B. M. 311;" copper nail in root, elevation 93.83 feet	30 00 35.48	95 19 36.60	4,806
Westfield, 1 mile south and 5 miles east of, 30 feet south of center of road; iron post stamped "Prim. Trav. Sta. No. 137, 1915," elevation 93.623 feet	30 00 24.84	95 19 08.84	2,667
Humble, 0.3 mile north and 2.6 miles west of T road southeast	30 00 10.93	95 18 31.96	3,535
Humble, 0.15 mile north and 2.25 miles west of, 55 feet south of center of road at angle; gum tree painted "U. S. B. M. 312"; copper nail in root, elevation 91.89 feet	30 00 02.89	95 18 12.37	1,905
Humble, 0.2 mile north and 1.5 miles west of, 40 feet north of center of road; gum tree painted "U. S. B. M. 313"; copper nail in root, elevation 89.58 feet	20 00 04.15	95 17 27.36	3,960
Humble, 0.2 mile north and 0.7 mile west of, 100 feet east of angle in road; 30 feet north of center of road; iron post stamped "Prim. Trav. Sta. No. 138, 1915," elevation 88.965 feet	30 00 04.35	95 16 36.44	4,477

WEEDEN QUADRANGLE—Continued.

From Spring to Humble through woods and along log tramroad.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Spring, 0.75 mile south and 3 miles east of, 400 feet N. 78° W. from residence of Mrs. Reardon, 120 feet south of a fence corner, 25 feet west of roadway; oak tree painted "U. S. B. M. 306"; copper nail in root, elevation 108.21 feet	30 04 05.37	95 21 59.16	.....
Spring, 0.85 mile south and 3 miles east of, about 400 feet south 40° west from residence of Mrs. Reardon; 15 feet northwest of large oak tree; iron post stamped "Prim. Trav. Sta. No. 135, 1915," elevation 108.363 feet	30 04 01.17	95 21 57.16	459
Spring, 0.9 mile south and 3.8 miles east of, about 0.3 mile northwest of Mr. Scanlon's house; in woods, at south side of road; oak tree painted "U. S. B. M. 307;" copper nail in root, elevation 105.19 feet	30 04 00.04	95 21 11.92	3,978
Spring, 1.15 miles south and 4.2 miles east of, 1,100 feet southeast of Mr. Scanlon's house, 20 feet south of fence corner at southeast corner of his field; pine tree painted "U. S. B. M. 316"; copper nail in root, elevation 98.99 feet	30 03 46.06	95 20 48.02	2,532
Humble, 4 miles north and 4.6 miles west of, 2.2 miles northwest of tramway crossing of Cypress Creek, 35 feet southwest of center of tramroad, in clearing; live-oak tree painted "U. S. B. M. 317"; copper nail in root, elevation 99.68 feet	30 03 23.62	95 20 31.46	2,693
Humble, 3.4 miles north and 4 miles west of, 50 feet east of tramroad and 90 feet north of a dim road crossing; oak tree painted "U. S. B. M. 318"; copper nail in root, elevation 102.66 feet	30 02 51.16	95 19 57.89	4,412
Humble, 2.63 miles north by 3.6 miles west of, 0.3 mile northwest of crossing of Cypress Creek, 12 feet south of tramway, in top of stump 15 inches high; copper nail painted "U. S. 80.4 B. M.," elevation 80.40 feet	.....	.....	.....
Humble, 2.65 miles north and 3.7 miles west of, 0.4 mile northwest of crossing of Cypress Creek, 8 feet east of tramroad; oak tree painted "U. S. B. M. 319"; copper nail in root not found in 1916	30 02 12.10	95 19 38.65	4,293
Humble, 2.3 miles north and 3.45 miles west of, 100 feet northwest of center of tramroad, bridge across Cypress Creek, 13 feet west of track; gum tree painted "U. S. B. M. 320," copper nail in root, elevation 61.05 feet	30 01 56.23	95 19 22.11	2,166
Humble, 1.85 miles north and 3 miles west of, 3,300 feet southeast of tramroad crossing of Cypress Creek, 15 feet west of track; oak tree painted "U. S. B. M. 321"; copper nail in root, elevation 97.78 feet	30 01 32.21	95 18 57.13	3,274
Humble, 1.4 miles north and 2.6 miles west of, 15 feet north of tramroad track; pine tree painted "U. S. B. M. 322"; copper nail in root, elevation 98.46 feet	30 01 08.88	95 18 30.97	3,293
Humble, 1.25 miles north and 2.1 miles west of, 115 feet west of dim settlement road crossing tramway (road leads to Evans ford on Spring Creek), 17 feet south of track in small clearing; iron post stamped "Prim. Trav. Sta. No. 139, 1915," elevation 96.985 feet	30 01 01.66	95 18 01.43	2,699
Humble, 0.9 mile north and 1.3 miles west of, 15 feet south of center of track; oak tree painted "U. S. B. M. 323"; copper nail in root, elevation 90.73 feet	30 00 42.73	95 17 14.65	4,537
Humble, 0.6 mile north and 0.6 mile west of, 8 feet north of tramroad; oak tree painted "U. S. B. M. 324"; copper nail in root, elevation 89.28 feet	30 00 24.49	95 16 31.18	4,243

Along Houston, East & West Texas Railway.

Humble, 1 mile north of, about 200 feet north of post marked "1 mile to Humble," 70 feet east of center of track; at edge of woods; gum tree painted "U. S. B. M. 472"; copper nail in root, elevation 65.88 feet	30 00 44.28	95 15 35.55	.....
Humble, 1.9 miles north of, opposite south end of trestle approach to bridge across San Jacinto River, 50 feet east of track and 20 feet lower in corner of right-of-way fence; iron post stamped "Prim. Trav. Sta. No. 196, 1915," elevation 48.359 feet	30 01 29.61	95 15 17.98	4,833
Humble, 2.5 miles north of, 350 feet north of wooden spur switch stand, 50 feet east of center of track at road crossing, pine tree painted "U. S. B. M. 471"; copper nail in root; not found in 1916	30 01 49.42	95 15 11.17	2,089
Weeden, opposite sign post Houston East & West Texas Ry., top of rail, elevation 62.9 feet	.....	.....	.....

KATY QUADRANGLE.

From point near northeast corner of quadrangle south, west, and north in northern part of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Katy, 5.4 miles north by 4 miles east of, 20 feet north by 20 feet east of T road, corners, roads north, south, and east; 6 inches from corner fence post; wire nail in hub; post painted "U. S. B. M. 124," elevation 145.76 feet	29 51 52.95	95 45 24.66	.....
Katy, 4.4 miles north by 4 miles east of, 20 feet west of center of north and south road, 3,600 feet south of crossroads; 6 inches from corner fence post; wire nail in hub; post painted "U. S. B. M. 125," elevation 144.61 feet	29 51 02.04	95 45 24.62	5,141
Katy, 4 miles north by 4 miles east of, at crossroads	29 50 45.39	95 45 24.19	1,682
Katy, 4.1 miles north by 3.5 miles east of, 0.5 mile east of Stockdick schoolhouse, 25 feet south of road, 3 feet from corner fence post at north and south fence line; iron post stamped "Prim. Trav. Sta. No. 60, 1915," elevation 142.479 feet	29 50 44.91	95 45 54.07	2,635
Stockdick schoolhouse, crossroads at	29 50 44.97	95 46 24.06	2,645
Katy, 4.1 miles north by 2.6 miles east of, 1,957 feet west of crossroads at Stockdick schoolhouse, 30 feet north of center of east and west road; 1 foot from telephone pole; copper nail in hub; painted "U. S. B. M. 126," elevation 145.81 feet	29 50 45.08	95 46 46.25	1,957
Katy, 4.1 miles north by 1.8 miles east of, 6,641 feet west of Stockdick schoolhouse, 30 feet north of center of road; 1 foot from telephone pole; copper nail in hub; witness stake painted "U. S. B. M. 127," elevation 149.86 feet	29 50 44.71	95 47 39.41	4,684
Katy, 4.1 miles north by 1 mile east of, 25 feet south by 25 feet east of center of crossroads, 2.5 feet from fence corner; iron post stamped "Prim. Trav. Sta. No. 61, 1915," elevation 154.086 feet	29 50 43.88	95 48 23.48	3,885
Katy, 4.1 miles north of, 633 feet east of crossroads, 30 feet north of road, 1 foot from corner fence post at fence north; copper nail in hub; witness stake painted "U. S. B. M. 128," elevation 157.45 feet	29 50 43.91	95 49 16.77	4,696
Katy, 4.1 miles north of; center of crossroads	29 50 43.50	95 49 23.93	633
Katy, 4.5 miles north of, 25 feet east of center of road, 6 inches from gatepost at north end of gate, near house painted green below and yellow above; copper nail in hub; post painted "U. S. B. M. 101," elevation 160.04 feet	29 51 09.93	95 49 23.93	2,671
Katy, 5.6 miles north of, 2,500 feet south of white schoolhouse on west side of road, opposite private lane west, 30 feet east of center of public road; iron post stamped "Prim. Trav. Sta. No. 49, 1915," elevation 160.140 feet	29 52 02.07	95 49 24.36	5,268
Katy, 6.1 miles north of, 300 feet north of schoolhouse; at crossroads, center of culvert, elevation 160.18 feet	.....	.....	.....
Katy, 6 miles north of; center of crossroads	29 52 28.28	95 49 24.95	2,649
Katy, 3.6 miles east of, about 50 feet south of Missouri, Kansas & Texas Ry.; 6 inches from telephone pole; copper nail in hub; pole painted "U. S. B. M. 95," elevation 130.36 feet	29 47 07.30	95 45 37.38	.....
Katy, 2.6 miles east of, about 50 feet south of Missouri, Kansas & Texas Ry., about 1.5 feet north of telephone pole, close to wire fence; 25 feet north of public road; pole painted "U. S. P. B. M.," United States Coast and Geodetic Survey bench mark, primary traverse station No. 46, 1915, elevation 134.488 feet	29 47 07.58	95 46 35.08	5,086
Stone culvert, northeast corner of, 70 feet southwest of private road crossing, elevation 137.53 feet	.....	.....	.....
Katy, 1.8 miles east of, about 50 feet south of railroad track, 25 feet north of center of road; 6 inches from telephone pole; copper nail in hub; pole painted "U. S. B. M. 96," elevation 135.46 feet	29 47 07.77	95 47 26.11	4,499
Katy, 0.9 mile east of, about 60 feet south of center of Missouri, Kansas & Texas Ry., 25 feet north of center of road, 6 inches from telephone pole; copper nail in hub; pole painted "U. S. B. M. 97," elevation 137.73 feet	29 47 07.97	95 48 17.14	4,499
Katy, 520 feet west of station, Missouri, Kansas & Texas Ry., 42 feet south of center of track; 4 feet east by 2 feet south of telephone pole; iron post stamped "Prim. Trav. Sta. No. 47, 1915," elevation 140.984 feet	29 47 08.32	95 49 18.65	5,423
Katy, in southwest corner foundation of water tank of Katy Rice Milling Co., about 175 meters (574 feet) west by 100 meters (328 feet) south of station; copper bolt set in lead (Coast and Geodetic Survey bench mark) "×7"), elevation 141.355 feet	29 47 05.41	95 49 19.57	305
County corner, Fort Bend, Waller, and Harris counties, on bank of branch of Buffalo Bayou, just west of town of Katy; a large stone monument (no elevation)	29 47 17.96	95 49 32.40	1,700
Katy, 0.8 mile north of, 20 feet west of center of road, 100 feet north of road forks, 600 feet south of white house with windmill on west side of road; 6 inches from cedar telephone pole; copper nail in hub; pole painted "U. S. B. M. 98," elevation 145.91 feet.	29 47 52.00	95 49 29.03	3,453
Katy, 1.7 miles north of, 20 feet west of center of road, opposite small house on west; copper nail in hub painted "U. S. B. M. 99," elevation 149.77 feet	29 48 38.95	95 49 29.55	4,748

KATY QUADRANGLE—Continued.

From point near northeast corner of quadrangle south, west, and north in northern part of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Katy, 2.8 miles north of, 20 feet east of center of road; close to fence line directly opposite a one and one-half story unpainted house on west side of road and about 800 feet north of red barn with star in each gable end on east side of road; iron post stamped "Prim. Trav. Sta. No. 48," elevation 156.620 feet	29 49 35.61	95 49 23.10	5,752
Katy, 3.7 miles north of, about 20 feet west of center of road, 0.5 foot from telephone pole, 3,160 feet north of crossroads; copper nail in hub; pole painted "U. S. B. M. 100," elevation 156.47 feet	29 50 22.52	95 49 24.00	4,740

Magnetic declination in quadrangle, 8° 45′ E.

HUMBLE QUADRANGLE.

Along public roads from Humble to Dyersdale.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Humble, station Houston East & West Texas Ry., 250 feet north of, 20 feet north of water tank, 12 feet east of center of track; 1 foot east of distance post to tank; copper nail in hub; post painted "U. S. B. M. 314," elevation 92.36 feet	29 59 54.78	95 15 55.80	.....
Humble, 0.8 mile south and 0.4 mile east of, 30 feet east of center of Humble-Houston road; 3 inches west of telephone pole; painted "U. S. B. M. 315"; copper nail in hub, elevation 87.35 feet	29 59 10.74	95 15 32.33	4,906
Humble, 1.4 miles south and 0.25 mile east of, 35 feet west of center of Humble-Houston road; 10 feet west of line of telephone poles; iron post stamped "Prim. Trav. Sta. No. 140, 1915," elevation 84.045 feet	29 58 37.40	95 15 41.47	3,464
Humble, 2.3 miles south of, 30 feet east of center of road, close to lane east; 1 foot from telephone pole painted "U. S. B. M. 325"; 371;" copper nail in hub, elevation 75.25 feet	29 57 53.84	95 15 50.93	4,479
Humble, 2.9 miles south of, 60 feet northeast of forks of road; 1 foot from corner fence post painted "U. S. B. M. 326"; copper nail in hub, elevation 66.96 feet	29 57 20.87	95 15 58.58	3,398
Humble, 3.4 miles south and 0.5 mile west of; crossroads	29 56 55.26	95 16 26.67	3,578
Humble, 3.8 miles south and 0.9 mile west of, 15 feet southeast of center of road; at base of double pine tree painted "U. S. B. M. 371"; copper nail in hub, elevation 73.58 feet	29 56 34.24	95 16 49.42	2,919
Humble, 4.2 miles south and 1.35 miles west of forks of road	29 56 10.23	95 17 15.65	3,349
Humble, 4.6 miles south and 1.3 miles west of, 1,200 feet south 35° east from crossing of Houston-Humble road and Houston, East & West Texas Ry., 25 feet east of center of road, at small wooden bridge; iron post stamped "Prim. Trav. Sta. No. 159, 1915," elevation 67.903 feet	29 55 50.03	95 17 14.75	2,043
Humble, 5.6 miles south and 1.3 miles west of, in edge of timber, 20 feet west of road; gum tree painted "U. S. B. M. 372"; copper nail in hub, elevation 58.48 feet	29 54 55.99	95 17 14.54	5,459
Humble, 6.3 miles south and 1.3 miles west, 20 feet west of road; gum tree painted "U. S. B. M. 373"; copper nail in root, elevation 65.42 feet	29 54 10.58	95 17 13.79	4,589
Humble, 6.5 miles south and 1.3 miles west of; T road north	29 53 56.89	95 17 13 40	1,384
Dyersdale, 0.5 mile north and 2 miles west of, 1,900 feet east of T road north, 10 feet north of road; iron post stamped "Prim. Trav. Sta. No. 160, 1915," elevation 68.848 feet	29 53 57.22	95 16 51.60	1,920
Dyersdale, 0.5 mile north and 1 mile west of, 10 feet north of road; oak tree painted "U. S. B. M. 374"; copper nail in root, elevation 62.70 feet	29 53 57.97	95 15 50.74	5,357
Dyersdale, 0.5 mile north and 0.15 mile west of, 350 feet southeast of forks of road, 20 feet southwest of center of road; oak tree painted "U. S. B. M. 375"; copper nail in root, elevation 57.36 feet	29 53 55.70	95 15 00.83	4,399

Along Beaumont, Sour Lake & Western Railway.

Dyersdale, 0.5 mile south and 0.15 mile west of, 50 feet northwest of center of track, just outside right of way fence; pine tree painted "U. S. B. M. 376"; copper nail in root	29 52 51.85	95 15 31.22	.....
Tree fallen down in 1916; copper rail in tree, elevation 61.27 feet	.....	.....	.....

HUMBLE QUADRANGLE—Continued.

On unchecked spur line near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Humble, 3.4 miles south and 0.2 mile west of, 1,500 feet east of crossroads; in pasture; pine tree painted "U. S. B. M. 361"; copper nail in root	29 56 56.53	95 16 09.43	
Humble, 4 miles south and 0.5 mile east of, 10 feet south of gate at south end of private lane, fences north, south, and west; 6 inches from first fence post south of gate; painted "U. S. B. M. 362"; copper nail in hub	29 56 25.94	95 15 26.46	4,883
Humble, 2.5 miles south and 0.7 mile east of, 4,500 feet northeast of forks on Houston-Humble Road, 20 feet west of T road north, 12 feet north of road in top of east end of concrete culvert; bronze tablet stamped "Prim. Trav. Sta. No. 141, 1915," elevation 68.884 feet	29 57 41.56	95 15 13.50	

Along highways near west border of quadrangle.

Aldine, 2.15 miles south of, 5 feet south and 50 feet east of public road crossing International & Great Northern Ry., 1 foot east of corner fence post; copper nail in hub; painted "U. S. B. M. 243" on corner post brace, elevation 76.77 feet	29 54 06.57	95 22 20.74	
International & Great Northern Ry. bridge 284; top of rail, elevation 79 feet			
Aldine, 3.10 miles south of, 1,500 feet south of bridge over creek, 30 feet west of center of road, 1 foot east of fence line; 15 feet east of telegraph pole painted "U. S. B. M. 244"; copper nail in hub, elevation 74.77 feet	29 53 18.46	95 22 08.73	4,974
Aldine, 3.70 miles south of, 55 feet east of center of track, 25 feet west of center of road, at gate in right-of-way fence, 4 feet east of north gate post; iron post stamped "Prim. Trav. Sta. No. 110, 1915," elevation 77.935 feet	29 52 49.44	95 22 01.44	3,002
Houston-Aldine road, 3.7 miles south of Aldine, 0.73 mile east of International & Great Northern Ry., 1 mile southwest of Halls Bayou, top of west end of concrete culvert; chiseled square painted "U. S. 73.1 B. M.," elevation 73.10 feet			

From point 5 miles south of Humble, southwest to point 4 miles north of Houston.

Houston-Humble road, 4 miles south of Humble, east side of road, top of concrete milepost 14, elevation 75.82 feet			
Humble, 4.2 miles south by 1.35 miles west of, 500 feet north of road crossing Houston East & West Texas Ry., at forks of road, northeast corner of small bridge, in plank; copper nail painted "U. S. 70.7 B. M.," elevation 70.36 feet			
Humble, 6 miles south of, about 1 mile south of Houston East & West Texas Ry. crossing, in bottom railing, east end of bridge; copper nail painted "U. S. 74.0 B. M.," elevation 73.32 feet			
Humble, 7 miles south of, 1,200 feet south of bridge over large drainage ditch, 25 feet east of road, 1 foot east of telephone pole painted "U. S. 69.0 B. M.," elevation 68.89 feet			
Humble, 7.25 miles south of, 0.5 mile south of bridge over large drainage ditch near T road west, in top of east head wall of brick culvert, at angle in road; chiseled square painted "U. S. 73 B. M.," elevation 72.38 feet			
Humble, 3 miles south of, 0.75 mile north of crossroads, 600 feet north of angle in road, in top of west brick head wall of culvert; chiseled square painted "U. S. 73 B. M.," elevation 73.00 feet			
Humole, 8.75 miles south of, 0.6 mile southwest of Mount Houston station on Houston East & West Texas Ry., at crossroads, opposite concrete highway milepost 10, in bottom railing, east end of bridge; copper nail painted "U. S. 70 B. M.," elevation 70.15 feet			
Houston, 9 miles north of, on Humble road, 190 feet southwest of concrete milepost 9, in top of east end of brick culvert; chiseled square painted "U. S. 67 B. M.," elevation 66.68 feet			

Magnetic declination for quadrangle, 8° 30′ E.

SEABROOK QUADRANGLE.

Along road from La Porte to Seabrook.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
La Porte, 3.15 miles south of, 450 feet north of small wooden bridge, 25 feet west of road; 18 inches east of fence line; iron post stamped "Prim. Trav. Sta. No. 207, 1915," elevation 13.982 feet	29 37 09.50	95 01 06.23	.....
La Porte, 4 miles south of, 30 feet east of road, at south end of gate; 1 foot west of gate post painted "U. S. B. M. 503"; copper nail in hub, elevation 14.83 feet	29 36 23.40	95 01 12.46	4,690
Seabrook, 2 miles north of, 490 feet north of small wooden bridge, 30 feet east of road, 10 feet north of fence corner; 1 foot west of post painted "U. S. B. M. 504"; copper nail in hub, elevation 16.37 feet	29 35 37.99	95 01 30.31	4,850
Seabrook, 1.25 miles north of, 50 feet east of Southern Pacific R. R., 30 feet west of road, 50 feet south of gate and private road crossing, opposite white house; 3 feet west of wire fence; iron post stamped "Prim. Trav. Sta. No. 208, 1915," elevation 22.514 feet	29 34 54.83	95 01 44.56	4,538
Seabrook, 1,840 feet north of, 30 feet west of road; 4 inches east of telephone pole painted "U. S. B. M. 505"; copper nail in hub, elevation 17.46 feet	29 34 07.81	95 01 36.74	4,801
Seabrook station, just north of; public road crossing Southern Pacific R. R	29 33 49.57	95 01 34.35	1,855
Seabrook, opposite station of Southern Pacific R. R.; top of rail, elevation 14.48 feet	.....	.....	.....
Seabrook, 1.7 miles north of, 100 feet southeast of road crossing Southern Pacific R. R., in bottom railing, west end of small wooden bridge, at angle in road; copper nail painted "U. S. 19.8 B. M.," elevation 19.90 feet	.....	.....	.....

From Seabrook to Webster along public road.

Seabrook station, 0.5 mile southwest of, 30 feet south of road, on top of concrete fence wall at fence corner, painted "U S. B. M. 506"; circle chiseled around corner, elevation 2.95 feet	29 33 32.35	95 01 55.24	2,537
Seabrook, 1 mile west of, 200 feet north of shore line of Clear Lake, 30 feet north of road, 10 feet west of advertising signboard marked "Houston 27 mi."; iron post stamped "Prim. Trav. Sta. No. 209, 1915," elevation 15.378 feet	29 33 44.91	95 02 37.95	3,980
Seabrook, 1.6 miles west of, 85 feet east of end of bridge over Taylor's Bayou, 20 feet northeast of center of road; oak tree painted "U. S. B. M. 507"; copper nail in root, elevation 15.30 feet	29 33 53.95	95 03 13.57	3,275
Seabrook, 2.5 miles west of, 25 feet north of road, 3 feet north of fence line; oak tree painted "U. S. B. M. 508"; copper nail in root of stump (tree blown over in 1915), elevation 19.03 feet	29 33 55.05	95 04 03.55	4,415
Webster, 1.4 miles north and 2.6 miles east of, 200 feet northeast of a bungalow, 100 feet west of end of Clear Lake, at approximate right angle in road, in line of road west; iron post stamped "Prim. Trav. Sta. No. 210, 1915," elevation 15.737 feet	29 33 20.25	95 04 29.60	4,202
Webster, 1.2 miles north and 1.75 miles east of, 25 feet north of road, nearly opposite a bungalow south of road; 6 inches south of telephone pole painted "U. S. B. M. 509"; copper nail in hub, elevation 19.13 feet	29 33 05.22	95 05 17.69	4,511
Webster, 0.7 mile north and 1 mile east of, 150 feet east of white house, 65 feet north of road, 35 feet north of gate; oak tree painted "U. S. B. M. 510"; copper nail in root, elevation 18.14 feet	29 32 50.49	95 06 05.14	4,447
Webster, 700 feet northeast of public road crossing of Galveston, Houston & Henderson R. R., 25 feet north of T road corners, road south to League City; iron post stamped "Prim. Trav. Sta. No. 211, 1915," elevation 25.734 feet	29 32 20.03	95 06 57.88	5,584
Webster, 0.3 mile southeast of, on right of way of Galveston, Houston & Henderson R. R., 40 feet southeast of mile board 22, 50 feet southwest of tracks; cross on top of section rail (C. & G. S. b. m. MM22), elevation 26.943 feet	.....	.....	.....
Webster, public road crossing Galveston, Houston & Henderson R. R	29 32 15.43	95 07 03.80	700

From Seabrook toward Deepwater along public road.

Seabrook, 1.7 miles north and 0.25 mile west of, public road crossing Southern Pacific R. R	29 35 18.36	95 01 49.00	.....
Seabrook, 1.8 miles north and 0.6 mile west of, 65 feet south of road, oak tree painted "U. S. B. M. 531"; copper nail in root, elevation 16.80 feet	29 35 23.37	95 02 10.33	1,959
Seabrook, 1.8 miles north and 1.25 miles west of, 1,750 feet west of Taylors Bayou, 35 feet north of road; oak tree painted "U. S. B. M. 532"; copper nail in root, elevation 13.86 feet	29 35 21.46	95 02 47.65	3,301

SEABROOK QUADRANGLE—Continued.

From Seabrook toward Deepwater along public road—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Seabrook, 1.9 miles north and 1.7 miles west of, 2,000 feet northwest of a right angle in road, 1,700 feet northeast of a house; 25 feet northeast of road beside wire fence which bears N. 50° E.; iron post stamped "Prim. Trav. Sta. No. 219, 1915," elevation 17.046 feet	29 35 27.87	95 03 14.91	2,492
Seabrook, 2.3 miles north and 2.25 miles west of, about 400 feet southwest of road, in field; oak tree 4 feet in diameter painted "U. S. B. M. 533"; copper nail in root, elevation 16.89 feet	29 35 49.59	95 03 49.80	3,781
Seabrook, 3.1 miles north and 3.1 miles west of, 50 feet southwest of road, at edge of woods; oak tree painted "U. S. B. M. 534"; copper nail in root, elevation 20.57 feet	29 36 32.07	95 04 41.41	6,259
Seabrook, 3.3 miles north and 3.35 miles west of, T road northeast	29 36 42.50	95 04 54.60	1,570
Seabrook, 3.5 miles north and 3.6 miles west of, 970 feet northwest of bridge, 20 feet southwest of road, at edge of woods; iron post stamped "Prim. Trav. Sta. No. 220, 1915," elevation 20.213 feet.	29 36 54.29	95 05 10.78	1,859
Seabrook, 4 miles north and 4.1 miles west of, 35 feet northeast of road; oak tree painted "U. S. B. M. 535"; copper nail in root, elevation 19.54 feet	29 37 16.46	95 05 39.16	3,360

Magnetic declination for quadrangle, 8° 10′ E.

LOUETTA QUADRANGLE.

Mostly along public roads.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Cypress, 3 miles north and 5 miles east of 1.5 miles west of West Montgomery road, 55 feet north of center of road; pine tree painted "U. S. B. M. 257"; copper nail in root, elevation 148.01 feet	30 00 45.13	95 36 51.33	4,641
Kohrville, about 0.5 mile north and 0.8 mile west of, 0.5 mile west of West Montgomery road, at north side of road; in root of oak tree painted "U. S. B. M. 258;" copper nail, elevation 144.63 feet	30 00 45.07	95 35 55.70	4,891
Culvert, 30 feet south of crossroads, on West Montgomery road; top of painted bolt at northeast corner of culvert, elevation 144.1 feet			
Kohrville, about ½ mile north and ¼ mile west of, T road west at junction with West Montgomery road	30 00 45.60	95 35 24.26	2,765
Kohrville, 0.5 mile north of, 300 feet north of a church, 25 feet west of road and 25 feet south of road west; iron post stamped "Prim. Trav. Sta. No. 117, 1915," elevation 142.128 feet	30 00 45.49	95 35 07.93	1,440
Louetta, 0.3 mile north of Trinity & Brazos Valley Ry. crossing, 90 feet south and 45 feet west of, 40 feet south of public road; in root of oak tree painted "U. S. B. M. 259"; copper nail, elevation 141.31 feet	30 01 19.71	95 34 14.24	5,850
Louetta, ¾ mile northeast of, 40 feet north of Cypress-Spring road; pine tree painted "U. S. B. M. 266"; copper nail in root, elevation 140.30 feet	30 01 42.05	95 33 36.94	3,981
Louetta, 1.5 miles northeast of, on Cypress-Spring road, 1.15 miles west of Stuebner "air line" road, 30 feet south of road, 25 feet east of fence corner; iron post stamped "Prim. Trav. Sta. No. 120, 1915," elevation 144.007 feet	30 02 07.18	95 33 09.74	3,488
Spring, 3 miles south and 7.5 miles west of, 2,300 feet southwest of Stuebner "air line" road, north side of bridge across creek, at west end of bridge railing; painted "U. S. B. M. 267"; copper nail in hub, elevation 139.11 feet	30 02 32.14	95 32 40.92	3,574
Spring, 2.8 miles south and 7.15 miles west of; crossroads	30 02 43.77	95 32 18.07	2,327
Spring, 2 miles south and 6.6 miles west of, 0.6 mile east of Stuebner "air line" road, 300 feet southeast of white house, 25 feet north of road and 6 feet west of corner fence post; iron post stamped "Prim. Trav. Sta. No. 199, 1915," elevation 139.348 feet	30 02 58.83	95 31 37.24	3,898
Spring, 2.2 miles south and 6.2 miles west of, 450 feet south of a T road northwest at edge of pine woods; in root of pine tree painted "U. S. B. M. 478"; copper nail, elevation 132.94 feet	30 02 50.70	95 31 12.17	2,352
Spring, 2.5 miles south and 5.4 miles west of, 0.2 mile west of white church, 25 feet south of center of road and 6 inches from large corner fence post painted "U. S. B. M. 477"; copper nail in hub, elevation 128.93 feet	30 02 34.05	95 30 26.57	4,348

LOUETTA QUADRANGLE—Continued.

Along Air Line road near Cypress Creek.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Cypress Creek, 2.65 miles northwest of, 25 feet west of road, 12 feet from fence corner; large pine tree painted "U. S. B. M. 268"; copper nail in root, elevation 135.52 feet	30 02 17.67	95 32 12.64	.....
Cypress Creek, 1.75 miles northwest of, 25 feet west of road, 5 feet east of large pine tree; iron post stamped "Prim. Trav. Sta. No. 121, 1915," elevation 124.014 feet	30 01 35.60	95 31 48.44	4,751
Cypress Creek, 0.9 mile northwest of, 100 feet southeast of bend of road, 30 feet east of road; oak tree painted "U. S. B. M. 269"; copper nail in root, elevation 118.82 feet	30 01 04.08	95 31 12.38	4,492
Cypress Creek, about 40 feet southwest of north end of bridge over; in root of mangolia tree painted "U. S. B. M. 270"; copper nail, elevation 108.27 feet	30 00 23.38	95 30 44.06	4,807

Along West Montgomery road north from International & Great Northern Railway.

Steubner, 1.2 miles east by 1.7 miles south of, 0.4 mile north of International & Great Northern Ry., 15 feet east of road and 6 inches from base of pine tree painted "U. S. B. M. 265"; copper nail in hub, elevation 133.52 feet	30 06 28.83	95 32 59.19	.....
Steubner, 1 mile east and 0.8 mile south of, 1 mile north and 0.5 mile west of, International & Great Northern Ry. crossing, 0.9 mile south of T road west, 40 feet east of road; oak tree painted "U. S. B. M. 264"; copper nail in root, elevation 146.37 feet	30 07 05.80	95 33 14.68	3,975

Near northeast corner of quadrangle.

Rotherwood spur, International & Great Northern Ry., 1.9 miles north and 0.5 mile west of, about 1,200 feet west of farmhouse, 10 feet south of wood road; post-oak tree 18 inches in diameter, painted "U. S. B. M. 301"; copper nail in root. NOTE.—Tree blown down. (Copper nail in top of stump, 37 feet southwest of original position of t. b. m. 301). Elevation 127.71 feet.	30 07 27.70	95 30 15.53	.....

Along highways near south border of north half of quadrangle.

Tomball station, about 165 feet north of Trinity & Brazos Valley Ry. depot, 20 feet west of track; in southwest corner of southeast concrete pier of water tank; bronze tablet stamped "Prim. Trav. Sta. No. 99, 1915," elevation 188.396 feet	30 05 55.28	95 36 50.33	5,383
Tomball, 0.75 mile east of, 90 feet north of crossroads (private road south), 15 feet east of center of north and south road; 6 feet from wire fence; in root of wild cherry tree painted "U. S. B. M. 223"; copper nail, elevation 183.64 feet	30 06 07.68	95 36 08.59	3,876
Hufsmith, about 0.60 mile south and 0.20 mile west of, about 900 feet south of church, 25 feet west of center of road, 6 inches from fence post, at angle in fence; painted "U. S. B. M. 224"; copper nail in hub, elevation 173.40 feet	30 06 50.25	95 35 58.91	4,383
Hufsmith, 200 feet northwest of station; public road crossing International & Great Northern Ry. (no elevation)	30 07 19.24	95 35 46.69	3,118

Along International & Great Northern Railway.

Hufsmith, about 1,400 feet east of, along International & Great Northern Ry. track, 550 feet south of track, nearly opposite milepost 11, 25 feet south and 30 feet west of a right angle in road; 4 feet south of corner fence post; iron post stamped "Prim. Trav. Sta. No. 100, 1915," elevation 174.796 feet	30 07 06.41	95 35 33.70	1,726
Hufsmith, 1.25 miles east of, 125 feet west of public road crossing, 35 feet south of center of track; 1 foot from telegraph pole (milepost 10) painted "U. S. B. M. 225"; copper nail in hub, elevation 150.22 feet	30 06 41.91	95 34 41.50	5,211
Hufsmith, 2.25 miles east of, 35 feet south of track; 6 inches from telegraph pole (milepost 9) painted "U. S. B. M. 226"; copper nail in hub, elevation 152.48 feet	30 06 22.76	95 33 47.28	5,141

LOUETTA QUADRANGLE—Continued.

Along International & Great Northern Railway—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Hufsmith, 2.60 miles east of, 0.30 mile east of mile post 9, 30 feet south of track, 850 feet east of a private road crossing 2½ feet north of telegraph pole; iron post stamped "Prim. Trav. Sta. No. 101, 1915," elevation 150.938 feet	30 06 19.58	95 33 29.35	1,606
Hufsmith, 3.35 miles east of, 625 feet east of milepost 8, 32 feet southeast of public-road crossing, 1½ feet northeast of crossing; sign post painted "U. S. B. M. 227"; copper nail in hub, elevation 137.82 feet	30 06 11.30	95 32 42.20	4,226
Willow, top of rail opposite store, elevation 148 feet			
Hufsmith, 4.30 miles east of, 280 feet east of road crossing, 32 feet south of track; 6 inches from telegraph pole (milepost 7) painted "U. S. B. M. 228"; copper nail in hub, elevation 145.92 feet	30 06 01.77	95 31 49.54	4,725
Hufsmith, 5.40 miles east of, 65 feet east of east end of "Avonak siding," 45 feet south of track; 10 feet south of milepost 6; iron post stamped "Prim. Trav. Sta. No. 102, 1915," elevation 143.855 feet	30 05 50.28	95 30 45.76	5,722
Spring, 5.20 miles west of; road crossing	30 05 46.85	95 30 23.95	1,947

MORGANS POINT QUADRANGLE.

Near Cedar Bayou.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Cedar Bayou post office, 0.2 mile south and 0.35 mile west of, 400 feet east of brick schoolhouse, 20 feet south and 20 feet east of T road south; hackberry tree in fence corner painted "U. S. B. M. 434"; copper nail in root, elevation 25.90 feet	29 44 58.71	94 56 08.88	
Cedar Bayou post office, 0.2 mile south and 1.35 miles west of, 25 feet north of road, opposites mail frame house; 6 feet south of fence line; iron post stamped "Prim. Trav. Sta. No. 183, 1915", elevation 38.211 feet	29 44 57.37	94 57 08.41	5,250
Cedar Bayou post office, 0.35 mile south and 2 miles west of, 45 feet north and 35 feet west of crossroads; 18 inches south of corner fence post painted "U. S. B. M. 435"; copper nail in hub, elevation 30.67 feet	29 44 50.88	94 57 50.07	3,731
Cedar Bayou post office, 0.4 mile south and 3 miles west of, 25 feet north of east end of wooden bridge, at edge of timber; oak tree painted "U. S. B. M. 436"; copper nail in root, elevation 24.01 feet	29 44 47.43	94 58 50.91	5,374
Cedar Bayou post office, 0.6 mile south and 3.75 miles west of, 0.6 mile west of Goose Creek at angle in road where rice irrigating canal crosses the road; 10 feet north of road and in line of canal; iron post stamped "Prim. Trav. Sta. No. 184, 1915", elevation 28.648 feet	29 44 57.24	94 59 32.31	3,782

Near west border of quadrangle.

La Porte, 1.7 miles northeast of, on road to Morgans Point, 400 feet southwest of railroad crossing; oak tree painted "U. S. B. M. 520"; copper nail in root, elevation 29.25 feet	29 40 36.09	94 59 38.47	
Morgans Point U. S. Corps of Engineers triangulation station. On the crest of Aliens Hill on the south side of San Jacinto Bay, on a bluff bank about 10 meters from F. Alien's fence and 18 meters southwest of an old fort or trench. The station is marked by a U. S. Corps of Engineers standard station mark and 3 feet below the ground by a rock with a copper wire in the center. There are two standard U. S. Corps of Engineers reference marks, one on range between the house on north end of Atkinsons Island and the station distant 18.29 meters; the other distant 18.41 meters in azimuth 358° 09′, elevation of station mark 28.042 feet	29 40 51.41	94 59 09.57	2,981

Magnetic declination for north side of quadrangle, 8° 02′ E.

MYKAWA QUADRANGLE.

Along highways in north half of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Minnetax schoolhouse, 1.6 miles south and 0.45 mile west of, 20 feet south and 20 feet west of T road south, 1 foot from corner fence post painted "U. S. B. M. No. 46"; copper nail in hub, elevation 56.59 feet	29 35 34.74	95 21 46.55	.....
Minnetax schoolhouse, 1 mile south and 0.25 mile east of, 500 feet north of road west, 25 feet east of north and south road, known as "Chocolate road"; iron post stamped "Prim. Trav. Sta. No. 23, 1915," elevation 55.560 feet	29 35 39.91	95 21 03.42	3,843
Minnetax schoolhouse, 0.6 mile south and 0.25 mile east of, 10 feet north of T road south, 28 feet east of northeast corner of bridge over ditch; copper nail in hub, witness stake, "U. S. B. M. No. 47" painted on bridge, elevation 58.93 feet	29 36 27.25	95 21 05.06	4,784
Minnetax schoolhouse, about 0.5 mile east of, on north side of road, 6 inches from fence post with braces on each side; copper nail in hub, post painted "U. S. B. M. No. 48," no elevation	29 36 59.10	95 20 49.54	3,497
Minnetax schoolhouse, 0.9 mile east of, Minnetax farmhouse, 900 feet west of, 40 feet north of culvert over drainage ditch, alongside fence post with two braces; spike in hub at foot of east brace, "T. B. M. 48 A.," elevation 51.96 feet	.....	.....	.....
Mykawa, 2 miles west of, 25 feet north of T road south, 1.5 feet from wire fence; iron post stamped "Prim. Trav. Sta. No. 24, 1915," elevation 50.729 feet	29 37 14.91	95 20 14.71	3,466
Mykawa, 1.2 miles west of, 25 feet north of center of east and west road, 1 foot from telephone pole painted "U. S. B. M. No. 49"; copper nail in hub, elevation 53.44 feet	29 37 14.71	95 19 23.05	4,560
Mykawa, 0.25 mile west of, 400 feet southwest of brick schoolhouse, 25 feet north of center of road, 1.5 feet south of telephone pole painted "U. S. B. M. No. 50"; copper nail in hub, elevation 56.04 feet	29 37 14.53	95 18 30.76	4,616
Mykawa station, 75 feet north of; Santa Fe R. R. at road crossing, elevation top of rail 57.5 feet	29 37 14.26	95 18 15.61	1,337
Mykawa station, 1,270 feet east of, 25 feet south of east and west road, 15 feet east of corner fence post, 150 feet southeast of house; iron post stamped "Prim. Trav. Sta. No. 25, 1915," elevation 56.672 feet	29 37 13.83	95 18 01.25	1,268
Mykawa station, about 1.15 miles east of, 500 feet south of T road east, 20 feet northeast of small wooden bridge, 6 inches from fence post in north and south fence line; copper nail in hub, bridge painted "U. S. B. M. No. 51," elevation 53.20 feet	29 37 14.11	95 17 06.92	4,796

In northeast quarter of quadrangle.

Friendswood, 1.8 miles north and 3.6 miles west of, 180 feet southeast of large ditch crossing road, 25 feet northeast of road, 1 foot west of gatepost, at northwest end of gate, painted "U. S. B. M. 526"; copper nail in hub, elevation 47.53 feet	29 33 15.46	95 15 35.50	.....
Friendswood, 2 miles north and 4 miles west of, T road corners, road northeast	29 33 25.59	95 16 00.80	2,458
Friendswood, 2.35 miles north and 3.7 miles west of, 0.5 mile S. 35° W. from new bridge across Clear Creek, nearly 0.5 mile N. 35° E. from Friendswood-Pearland road, 20 feet northwest of road at fence line; iron post stamped "Prim. Trav. Sta. No. 217, 1915," elevation 47.590 feet	29 33 43.24	95 15 41.80	2,449
Genoa, 4.1 miles south and 3.5 miles west of, center of new bridge across Clear Creek	29 34 02.56	95 15 20.36	2,720

North across prairie.

Genoa, 3.3 miles south and 3.5 miles west of, in open prairie, at wire fence line which bears S. 35° W., about 1,000 feet northeast of point where fence meets Clear Creek, 6 inches east of fence post, not painted, marked with red keel "U. S. B. M. 530"; copper nail in hub, elevation 44.97 feet	29 34 31.95	95 15 24.57	2,992
Genoa, 2.3 miles south and 3.5 miles west of, in open prairie 0.25 mile east of Clear Creek, 6 inches south of gate post at double gate, fence down, post not painted marked with red keel "U. S. B. M. 529"; copper nail in hub, elevation 46.78 feet	29 35 20.41	95 15 25.78	4,896
Genoa, 1.8 miles south and 3.25 miles west of, in open prairie, water tank at Genoa bears N. 52° 30′ E., nearest timber on Clear Creek is S. 37° W., about 0.75 mile, on small mound about 2 feet above level of prairie; iron post stamped "Prim. Trav. Sta. No. 218, 1915", elevation 50.053 feet	29 35 47.70	95 15 07.44	3,197

MYKAWA QUADRANGLE—Continued.

North across prairie—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Genoa, 1.2 miles south and 3.2 miles west of group of mulberry trees, four out of six blown over by recent storm, most easterly tree partly blown over in 1915, painted "U. S. 53.2 B. M;" copper nail in root; elevation, 53.17 feet	29 36 19.53	95 15 05.25	3,221
Genoa, 0.4 mile south and 3.2 miles west of, 3,600 feet south of Genoa-Mykawa road on east and west fence line, between posts 55 and 56 east from fence corner; copper nail in hub; no painting; elevation, 48.26 feet	29 37 00.95	95 15 05.08	4,184

Magnetic declination for quadrangle 8° 15′ E.

NEW CANEY QUADRANGLE.

Near Scotts Ranch.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Scotts Ranch, 0.75 mile southwest of; oak tree painted "U. S. B. M. 452," copper nail in root, elevation 67.21 feet	30 07 35.03	95 07 43.84	.....

Magnetic declination for quadrangle, 8° 30′ E.

SCOTTS RANCH QUADRANGLE.

Near Scotts Ranch.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Scotts Ranch, 0.5 mile south and 0.4 mile east of, 5 feet south of road; oak tree painted "U. S. B. M. 451," copper nail in root, elevation 97.48 feet	30 07 35.90	95 06 48.88	.....
Scotts Ranch, about 500 feet south and 100 feet east of residence of Austin Scott, 40 feet south of fence, east side of road; iron post stamped "Prim. Trav. Sta. No. 190, 1915," elevation 73.105 feet	30 07 59.65	95 07 11.07	3,091

Magnetic declination for quadrangle, 8° 30′ E.

HOLIK QUADRANGLE.

Near east border north from center line of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Hockley, 6.4 miles south by 1.9 miles west of, 200 feet east of corner post on fence line which bears N. 19° W. (true bearing), 6 inches from west gatepost; copper nail in hub, gate painted "U. S. B. M. 186," elevation 173.69 feet	29 56 02.59	95 52 35.49	.....
Hockley, 5.5 miles south by 2.3 miles west of, near Harris-Waller county line, 2 feet from wire fence; iron post stamped "Prim. Trav. Sta. No. 82, 1915," elevation 181.951 feet	29 56 51.17	95 52 56.62	5,247
Hockley, 4.8 miles south by 2.5 miles west of, along fence near Harris-Waller county line, about 500 feet west of house in clump of china-berry trees, at south end of gateway 6 inches from gatepost; copper nail in hub, post painted "U. S. B. M. 187," elevation 191.53 feet	29 57 27.69	95 53 10.84	3,895
Hockley, 3.9 miles south by 2.4 miles west of, 800 feet southwest of large white house, fifteenth fence post northwest of bend in fence line, 1 foot from fence post; copper nail in hub, post painted "U S. B. M. 188," elevation 203.85 feet	29 58 12.68	95 53 03.23	4,593

HOLIK QUADRANGLE—Continued.

Near east border north from center line of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Hockley, 2.8 miles south by 2.5 miles west of, on top of what is known as "The Mound," a small hill having an elevation of about 15 feet above the surrounding prairie, 35 feet N. 40° E. (true bearing) from the most easterly one of two lone chinaberry trees; iron post stamped "Prim. Trav. Sta. No. 83, 1915," elevation 244.869 feet	29 59 11.32	95 53 13.61	5,993
Hockley, 2.4 miles south by 2.2 miles west of, at south end of lane, where a road turns east, 2 feet north and 1 foot west of west gate-post in east-west fence; copper nail in hub, gate painted "U. S. B. M. 189," elevation 231.66 feet	29 59 31.83	95 52 53.05	2,750

Magnetic declination in northeast quarter of quadrangle, 8° 30′ E.

PARK PLACE QUADRANGLE.

Along highways in northern part of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Pasadena, 3 miles west of, 125 feet west of west approach to bridge over Simms Bayou, 20 feet north of center of road; iron post stamped "Prim. Trav. Sta. No. 3, 1915," elevation 19.827 feet	29 42 37.89	95 15 25.37	.....
Pasadena, 3.75 miles west of, 130 feet south of Southern Pacific R. R., 20 feet east of private road south, 1 foot from telephone pole painted "U. S. B. M. No. 5"; copper nail in hub, elevation 35.27 feet	29 42 51.97	95 16 06.38	3,886
Harrisburg, 0.5 mile south of; T road east	29 42 51.61	95 16 41.51	3,098

Along Galveston, Houston & Henderson Railroad from Harrisburg to Houston.

Harrisburg station, 0.3 mile north of, center of railroad bridge over Brays Bayou, elevation 27.9 feet	29 43 38.45	95 16 42.96	4,734
Harrisburg station, 0.6 mile north of, on east side of track, center of top surface of concrete culvert; copper bolt set in lead and lettered "U. S. B. M." (Coast and Geodetic Survey bench mark "N8"), elevation 23.359 feet	.....	.....	.....
Harrisburg station, 1.2 miles northwest of, 270 feet east of point where Forest Hill boulevard passes under Galveston, Houston & Henderson R. R., 50 feet north of center of railroad track, 4 feet from fence line; iron post stamped "Prim. Trav. Sta. No. 4, 1915," elevation 39.215 feet	29 43 54.43	95 17 49.87	6,116
Houston, Second Street crossing of Galveston, Houston & Henderson R. R., 50 feet west of line of Fifteenth Street, about 30 feet south of center of railroad track, 2 feet from telephone pole painted "U. S. B. M. No. 7"; copper nail in hub, elevation 39.61 feet	29 44 07.16	95 18 32.98	2,388
Houston, intersection of Houston Belt & Terminal and Galveston, Houston & Henderson R. R.; top of rail, elevation 42.2 feet	.....	.....	.....
Houston, road crossing 80 feet northeast of entrance to Evergreen Cemetery; top of rail, elevation 45 feet	.....	.....	.....
Houston, Dumble Street crossing of Galveston, Houston & Henderson R. R., 25 feet south and 50 feet west of center of track; 1 foot from telephone pole painted "U. S. B. M. No. 8"; copper nail in hub, elevation 43.07 feet	29 44 25.92	95 19 32.29	5,561
Houston, Eastwood Avenue crossing	29 44 30.75	95 19 46.85	1,375
Houston, Milby Street crossing, 300 feet northeast of Houston Belt & Terminal R. R.; top of rail, elevation 48.6 feet	.....	.....	.....
Houston, about 0.75 mile southeast of International & Great Northern Ry. station, in line with long tangent east on Galveston, Houston & Henderson R. R., 48 feet S. 17° 20′ E. of intersection of Galveston, Houston & Henderson R. R. and San Antonio & Aransas Pass Ry. freight spur to packing house; iron post stamped "Prim. Sta. No. 5, 1915," elevation 48.631 feet	29 44 47.32	95 20 39.51	4,935
International & Great Northern Ry. and San Antonio & Aransas Pass Ry. branch to packing house, intersection of, elevation top of rail 49.4 feet	29 44 34.22	95 20 52.72	1,761
Houston, at intersection of International & Great Northern Ry. and Pierce Avenue, between tracks of Galveston-Houston Interurban Ry.; 1 foot from power-line pole, 27 fee distan from crossing; copper nail in hub; "T. B. M. No. 9," elevation 46.97 feet	29 44 16.14	95 21 07.05	2,220

PARK PLACE QUADRANGLE—Continued.

Along Galveston, Houston & Henderson Railroad from Harrisburg to Houston—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Houston, intersection of San Antonio & Aransas Pass Ry. and Galveston-Houston Interurban tracks; top of rail, elevation 51.1 feet			
Houston, Pierce Avenue crossing of San Antonio & Aransas Pass Ry.	29 44 32.77	95 21 34.55	2,950
Houston, S. 27° E. and 35 feet distant from intersection of McGowan Avenue and San Antonio & Aransas Pass Ry.; 2 feet from telephone pole painted "U. S. B. M. No. 10," 15 feet from corner of yard fence; copper nail in hub, elevation 47.11 feet	29 44 18.90	95 21 48.17	1,844
Along highways in southern part of quadrangle.			
Mykawa, about 1.5 miles northeast of; right-angle turn in road	29 37 32.38	95 16 42.32	
Mykawa, 1.7 miles east by 0.2 mile north of, 1,000 feet east of right angle in road, 20 feet south of center of east and west road; 1 foot from post painted "U. S. B. M. No. 52"; copper nail in hub, elevation 50.65 feet			
Mykawa, 2.6 miles east by 0.2 mile north of, 35 feet north of center of east and west road, 2.5 feet from corner fence post at small cemetery; iron post stamped "Prim. Trav. Sta. No. 26, 1915," elevation 51.727 feet	29 37 35.50	95 15 39.53	5,551
Along Southern Pacific Railroad cut-off.			
Pierce Junction, 1.8 miles northeast of, 25 feet south of milepost No. 2, 60 feet west of crossroads; nail in hub, "T. B. M. No. 69," elevation 48.72 feet	29 40 44.71	95 22 02.66	
Pierce Junction, 2.8 miles northeast of, 800 feet northeast of road crossing, 48 feet south of center of track, 1 foot from fence post; copper nail in hub; "T. B. M. No. 70," elevation 46.06 feet	29 40 59.75	95 21 12.60	4,668
Santa Fe R. R. crossing, 1.4 miles west of, 50 feet south of center of track; iron post stamped "Prim. Trav. Sta. No. 35, 1915," elevation 45.412 feet	29 41 08.46	95 20 43.49	2,713
Santa Fe R. R. crossing, 0.4 mile west of; 50 feet south of center of track, 40 feet west of double gate; copper nail in hub; post painted "U. S. B. M. No. 71," elevation 42.08 feet	29 41 31.40	95 19 52.52	5,057
Santa Fe R. R. crossing of Southern Pacific R. R. cut-off to Harrisburg, elevation top of rail 44.3 feet	29. 41 42.49	95 19 35.90	1,844
Brookline, crossing of Galveston-Houston electric line and Southern Pacific cut-off, 1 mile southwest of, 11 feet from center of track; chiseled square on corner of concrete foundation of semaphore post, "t. b. m. No. 72," elevation 44.13 feet	29 42 00.77	95 19 07.11	3,140
Brookline, crossing of Galveston-Houston electric line and Southern Pacific cut-off, 0.25 mile southwest of, on south side of track, on west side of wagon road, 2 feet from fence corner; iron post stamped "Prim. Trav. Sta. No. 36, 1915," elevation 42.193 feet	29 42 21.64	95 18 31.82	3,759
Brookline, intersection of Galveston-Houston Interurban and Southern Pacific cut-off tracks; top of rail, elevation 43.1 feet			
Along highways.			
Brookline, 0.6 mile northeast of, 30 feet northwest of center of public road, 1 foot from fence corner; post painted "U. S. B. M. No. 73"; copper nail in hub, elevation 40.14 feet	29 42 46.94	95 17 48.46	4,599
Harrisburg station, crossing of Galveston, Houston & Henderson R. R.	29 43 08.33	95 17 08.98	4,098
Harrisburg station, 40 feet northeast of crossing of Galveston, Houston & Henderson R. R., 15 feet north of corner of station, nearly under fence line; copper nail in hub, "U. S. B. M. No. 74", elevation 39.68 feet	29 43 08.45	95 17 08.49	43
Harrisburg station, 80 feet south of crossing of Galveston, Houston & Henderson R. R., at fence corner, 40 feet west of track, cross on end of section of rail driven in ground (Coast and Geodetic Survey b. m. "R. M.," value discarded equals 38.271 feet), elevation 38.400 feet			
Brookline, 0.9 mile south of, on Alvin road, 280 feet south of wooden bridge, 4 feet south of mail box No. 117, 12 feet west of center of road; copper nail in hub; post painted "U. S. B. M. No. 75," elevation 37.64 feet	29 41 52.17	95 18 05.13	

PARK PLACE QUADRANGLE—Continued.

Along highways—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Brookline, 1.9 miles south of, Park Place, 1 mile west of, 40 feet southeast of road forks; 1 foot from corner fence post painted "U. S. B. M. No. 76"; copper nail in hub, elevation 40.20 feet	29 41 05.25	95 17 46.17	5,024
Brookline, 2.8 miles south of, 420 feet south of bridge over Simms Bayou, 15 feet west of center of road, opposite private lane to Ed. Drouet's house; iron post stamped "Prim. Trav. Sta. No. 37, 1915," elevation 34.270 feet	29 40 21.02	95 17 21.17	4,979
Brookline, 3.8 miles south of, Simms Bayou Bridge, about 1 mile south of, 25 feet east of center of road, 6 inches from corner of fence post at fence line east; copper nail in hub, post painted "U. S. B. M. No. 77," elevation 43.82 feet	29 39 27.97	95 17 19.72	5,360
Brookline, 4.6 miles south of, Simms Bayou Bridge, 1.8 miles south of, 25 feet west of center of road, 6 inches from fence post; copper nail in hub; post painted "U. S. B. M. No. 78," elevation 47.21 feet	29 38 46.56	95 17 19.54	4,182
Mykawa, 1.1 miles east by 1 mile north of, 38 feet east of center of road, 12 feet east of north and south fence line; 2 feet north of east and west fence line; iron post stamped "Prim. Trav. Sta. No. 38, 1915," elevation 49.121 feet	29 38 08.91	95 17 08.00	3,934

Magnetic declination of quadrangle, 8° 13′ E.

Along highways near northeast corner of quadrangle.

Fidelity addition, 1.1 miles north of Houston-Clinton road, about 800 feet southwest of a small white cabin, 20 feet west of main north-south graded road; iron post stamped "Prim. Trav. Sta. No. 171, 1915," elevation 35.614 feet	29 44 51.41	95 15 19.61	.....
Fidelity addition, 435 feet east of point where gravel road crosses track, 30 feet north of gravel road and 15 feet east of graded street north, on southwest corner of base of east concrete monument; chiseled mark, "U. S. B. M. 399," painted on wooden bridge, elevation 37.87 feet	29 43 54.59	95 15 18.14	5,741
Fidelity addition, 0.8 mile northwest of, 30 feet southwest of Houston-Clinton road, 500 feet southeast of a private road crossing on railway; in root of pine tree painted "U. S. B. M. 400"; copper nail, elevation 35.12 feet	29 44 15.13	95 16 02.64	4,440
Crossing of Galveston, Harrisburg & San Antonio Ry. and Houston Belt & Terminal Ry., 1.9 miles southeast of, 25 feet northeast of of Houston-Clinton road and 10 feet west of dim road crossing; iron post stamped "Prim. Trav. Sta. No. 172, 1915," elevation 37.762 feet	29 44 35.03	95 16 31.92	3,271
Port Houston, 555 feet south 47° west from city limit post at angle of Clinton road, about 900 feet southwest from public road crossing on Galveston, Harrisburg & San Antonio Ry., and a little below turning basin of ship channel; a stone post with a tablet marked "U. S. Engrs.' B. M." set in top; post is painted on one side "300" "132+291.4," elevation 37.425 feet	29 44 51.61	95 17 07.10	3,526
Port Houston, near city limit post; public road crossing railway	29 44 58.45	95 17 00.94	878
Harrisburg, 1 mile south of, crossing of Galveston, Houston & Henderson R. R., and shell road from Harrisburg to Park Place, 50 feet south of track, 25 feet east of road; iron post with 3-inch red metal cap stamped "U. S. Coast & Geodetic Survey B. M. 'O_8,'" elevation 37.503 feet	.....	.....	.....
Harrisburg, 3.75 miles southeast of; on the right of way of Galveston, Houston & Henderson R. R., 50 feet southeast of mile board 9 and 50 feet southwest of track; cross on end of section of rail driven in ground (Coast and Geodetic Survey bench mark "M9"), elevation 35.308 feet	.....	.....	.....

PARK PLACE QUADRANGLE—Continued.

U. S. Corps of Engineers bench marks along Buffalo Bayou.

Station.	Latitude.	Longitude.	Distance between stations.
These bench marks are probably all bronze tablets marked "U. S. Engineer Department," set in top of concrete posts, 6 inches square on top and protruding above ground. The letters R and L of the descriptions refer to right and left bank going downstream, and the distances given are probably the approximate distances from the bank.	° ′ ″	° ′ ″	*Feet.*
Station 132+291, 300 R, elevation 25.797 feet			
Station 131+027, 300 R, elevation 29.898 feet			
Station 130+092, 300 R, elevation 15.897 feet			
Station 128+822, 300 R, elevation 15.281 feet			
Station 127+244, 300 R, elevation 8.086 feet			
Station 126+987, 300 R, elevation 16.392 feet			
Houston Launch Club, in southeast corner, railroad iron, elevation 26.53 feet			
Station 121+846, 300 R, elevation 9.452 feet			
Station 119+799, 300 R, elevation 18.760 feet			
Station 119+258, 300 R, elevation 21.123 feet			
Station 117+781, 300 R, elevation 26.636 feet			
Station 117+281, 300 R, elevation 24.312 feet			
Station 116+281, 300 R, elevation 13.576 feet			
Station 115+436, 300 R, elevation 17.846 feet			
Station 114+685, 300 R, elevation 23.244 feet			
Station 132+291, 300 L, elevation 37.425 feet			
Station 131+804, 300 L, elevation 22.741 feet			
Station 131+027, 300 L, elevation 22.996 feet			
Station 130+292, 300 L, elevation 17.116 feet			
Station 128+822, 300 L, elevation 18.362 feet			
Station 127+844, 300 L, elevation 27.487 feet			
Station 126+967, 300 L, elevation 23.296 feet			
Station 126+293, 300 L, elevation 15.037 feet			
Station 125+588, 300 L, elevation 21.534 feet			
Station 124+846, 300 L, elevation 24.490 feet			
Station 123+346, 300 L, elevation 31.624 feet			
Station 121+846, 300 L, elevation 22.636 feet			
Station 120+730, 300 L, elevation 21.672 feet			
Station 119+999, 300 L, elevation 22.883 feet			

PAULI QUADRANGLE.

Between Huffman and Ford's farm, along little-used woods road from Huffman to Porter.

Station.	Latitude.	Longitude.	Distance between stations.
Huffman, 2.7 miles west and 1.4 miles north of, 0.5 mile northwest of ford across San Jacinto River, near mouth of Loose Bayou, 20 feet north of dim road in timber; gum tree painted "U. S. B. M."; iron post stamped "Prim. Trav. Sta. No. 193, 1915," elevation 52.648 feet	° ′ ″ 30 02 38.77	° ′ ″ 95 07 46.80	*Feet.*
Huffman, 3.3 miles west and 1.6 miles north of, at north side of road; oak tree painted "U. S. B. M. 463"; copper nail in root, elevation 58.70 feet	30 02 50.96	95 08 25.19	3,591
Huffman, 3.9 miles west and 2.1 miles north of, 50 feet north of road; oak tree painted "U. S. B. M. 464"; copper nail in root, elevation 62.94 feet	30 03 19.10	95 09 01.16	4,251
Huffman, 4.4 miles west by 3 miles north of, in fork of dim woods road, in notch at base of 2-foot oak tree; wire nail painted "U. S. 52.5 B. M.," elevation 52.49 feet			
Huffman, 4.3 miles west and 2.9 miles north of, 100 feet west of road, on small knoll; large oak tree painted "U. S. B. M. 465"; copper nail in root. Not found in 1916	30 03 57.93	95 09 26.81	4,524
Huffman, 4.6 miles west and 3.4 miles north of, 25 feet west of road, in woods; pine tree painted "U. S. P. B. M."; iron post stamped "Prim. Trav. Sta. No. 194, 1915," elevation 74.737 feet	30 04 22.01	95 09 43.62	2,846
Huffman, 5.25 miles west and 3.6 miles north of, 60 feet south of road, 90 feet south of southwest corner of cleared field; elm tree painted "U. S. B. M. 466"; copper nail in root, elevation 69.60 feet	30 04 34.52	95 10 21.85	3,588
Huffman, 5.8 miles west and 3.85 miles north of, at south side of road; white oak tree painted "U. S. B. M. 467"; copper nail in root, elevation 71.77 feet	30 04 47.79	95 10 54.81	3,190

PAULI QUADRANGLE—Continued.

Southwest from Scott's ranch, close to Harris-Montgomery County line, to county line crossing of Houston, East & West Texas Ry. all through woods.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Scott's ranch, 1.4 miles southwest of, 1,000 feet northerly from house in clearing, 25 feet east of road, and 25 feet east of gate in wire fence, magnolia tree painted "U. S. B. M. 453"; copper nail in root, elevation 70.70 feet	30 07 17.28	95 08 17.68	.....
Scott's ranch, 2 miles southwest of; large gum tree notched 4 times in 3 sides supposed to be on Harris-Montgomery county line, ground elevation 66.8 feet	30 07 08.03	95 08 45.47	2,614
Scott's ranch, 2.2 mile southwest of; pin-oak tree painted "U. S. B. M. 454"; copper nail in root, elevation 67.32 feet	30 07 01.76	95 08 53.84	971
Scott's ranch, 3 miles southwest of; near magnolia tree painted "U. S. P. B. M."; iron post stamped "Prim. Trav. Sta. No. 191, 1915," elevation 66.296 feet	30 06 35.68	95 09 27.23	3,943
Scott's ranch, 3.75 miles southwest of; oak tree painted "U. S. B. M. 455"; copper nail in root, elevation 69.23 feet	30 06 08.25	95 10 04.72	4,304
Scott's ranch, 4.5 miles southwest of; magnolia tree painted "U. S. B. M."; copper nail in root, elevation 56.90 feet	30 05 41.56	95 10 38.76	4,026
Scott's ranch, 5.3 miles southwest of; oak tree painted "U. S. B. M. 457"; copper nail in root, elevation 71.38 feet	30 05 12.24	95 11 09.23	3,992
Scott's ranch, 5.6 mile southwest of, 0.5 mile southeast of Mr. Ford's farm, 15 feet east of road; iron post stamped "Prim. Trav. Sta. No. 192, 1915," elevation 73.125 feet	30 05 00.58	95 11 23.80	1,740
Humble, 5.4 miles north and 4 miles east of, 300 feet south of a clearing; maple tree painted "U. S. B. M. 458"; copper nail in root, elevation 72.69 feet	30 04 35.26	95 11 57.04	3,883
Humble, 5 miles north and 3.3 miles east of; oak tree painted "U. S. B. M. 459"; copper nail in root, elevation 80.11 feet	30 04 16.42	95 12 37.31	4,018
Humble, 4.5 miles north and 2.7 miles east of; large oak tree painted "U. S. B. M. 468"; copper nail in root, elevation 80.31 feet	30 03 49.13	95 13 16.00	4,377
Humble, 4 miles north and 2 miles east of; near tree painted "U. S. B. M."; iron post stamped "Prim. Trav. Sta. No. 195, 1915," elevation 78.970 feet	30 03 23.39	95 13 51.62	4,069
Humble, 3.6 miles north and 1.5 miles east of, 500 feet north and 0.4 mile east of road crossing at McCarthys spur; pine tree painted "U. S. B. M. 469"; copper nail in root, elevation 79.07 feet	30 03 04.30	95 14 24.83	3,498
Humble, 3.5 miles north by 1.1 miles east of, 0.5 mile northeast of Harris-Montgomery county line, 70 feet east of road crossing, at McCarthy's spur, in top of wooden bulkhead, south side of cattle guard 21 D; copper nail painted "U. S. 82.6 B. M.," elevation 82.42 feet	.....	.....	.....
Humble, 3.5 miles north and 1.1 miles east of; center of road crossing Houston East & West Texas Ry. at McCarthys spur	30 02 59.41	95 14 50.95	2,348
Humble, 3.1 miles north and 0.9 mile east of, center of Houston East & West Texas Ry. track, opposite post marked "Harris County-Montgomery County"	30 02 35.10	95 14 59.38	2,565
County line post, 6 inches east of; copper nail in hub, t. b. m. 470, elevation 81.01 feet	30 02 35.20	95 14 59.80	38

Magnetic declination for quadrangle, 8° 30′ E.

ROSEHILL QUADRANGLE.

Along highways near north and east borders of southeast quarter of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Rosehill, 2.15 miles west of, on road to Hockley, 20 feet south of road; 1 foot from corner post on fence line south, painted "U. S. B. M. 206"; copper nail in hub, elevation 231.09 feet	30 04 44.39	95 44 37.63	.....
Rosehill, 1.60 miles west of, crossroads	30 04 47.86	95 44 09.33	2,512
Rosehill, 1.25 miles west of, on Hockley Road, 30 feet north of center of road, opposite house on south side of road, 1 foot south of fence post painted "U. S. B. M. 207"; copper nail in hub, elevation 225.20 feet	30 04 52.69	95 43 43.83	2,293
Rosehill, 0.7 mile west of, on Hockley Road, about 500 feet southwest of yellow house, 35 feet north of center of road, 6 feet from corner of fence post; iron post stamped "Prim. Trav. Sta. No. 92, 1915," elevation 219.825 feet	30 04 50.22	95 43 09.68	3,012
Rosehill, about 0.70 mile north of church, 15 feet south and 15 feet east of crossroads; 1 foot from corner fence post painted "U. S. B. M. 208"; copper nail in hub, elevation 215.72 feet	30 04 43.95	95 42 31.53	3,412

ROSEHILL QUADRANGLE—Continued.

Along highways near north and east borders of southeast quarter of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Rosehill, about 0.50 mile east of church, 10 feet south and 15 feet west of T road west, at northeast corner of bridge on road west, 1 foot east of railing post; copper nail in hub, bridge painted "U. S. B. M. 209" (NOTE.—A new bridge has been built and the prim. trav. hub destroyed. A level bench mark was established at southeast corner of bridge, 1 foot east of railing post; copper nail in timber, elevation 197.60 feet.)	30 04 14.26	95 41 59.71	4,099
Rosehill Church, about 0.75 mile southeast of; T road south	30 04 00.05	95 41 49.79	1,679
Rosehill Church, about 0.70 mile south and 0.70 mile east of, 2,350 feet south of T road south, 20 feet east of center of road, 2 feet from fence line; iron post stamped "Prim. Trav. Sta. No. 93, 1915," elevation 188.444 feet	30 03 36.84	95 41 49.20	2,346
Cypress, 5.1 miles north of, 20 feet west of center of road, opposite gate on east side of road, 20 feet north of corner post on fence line west; iron casting 6 inches in diameter set in ground and painted "U. S. B. M. 210"; fence post 20 feet south has "B. M." painted on it, top of casting, elevation 169.24 feet	30 02 40.38	95 41 50.79	5,706
Cypress, 4.1 miles north of, 25 feet east of center of road; 1 foot west of large corner fence post painted "U. S. B. M. 211"; copper nail in hub, elevation 165.60 feet	30 01 49.28	95 41 49.66	5,163
Cypress, 3.8 miles north of; crossroads	30 01 27.23	95 41 49.72	2,228
Cypress, 3.2 miles north of, 700 feet north of bridge over Little Cypress Creek, 20 feet west of center of road, in group of oak trees; iron post stamped "Prim. Trav. Sta. No. 94, 1915," elevation 161.270 feet	30 01 03.42	95 41 49.53	2,405
Cypress, 2.40 miles north of, 520 feet north of culvert, 25 feet west of center of road, 1 foot east of fence post painted "U. S. B. M. 212"; copper nail in hub, elevation 162.63 feet	30 00 19.79	95 41 51.87	4,413

Along highways near south border of northeast quarter of quadrangle.

Rosehill schoolhouse, about 50 feet north of, 25 feet south of center of road, at wire fence line; in root of chinaberry tree painted "U. S. B. M. 218," elevation 222.95 feet	30 04 49.04	95 41 46.33	.....
Rosehill schoolhouse, about 0.90 mile east of, 20 feet north and 20 feet east of crossroads; 6 inches from corner fence post painted "U. S. B. M. 219," elevation 220.51 feet	30 04 44.90	95 40 53.35	4,675
Rosehill schoolhouse, about 1.35 miles east of, 25 feet south and 15 15 feet east of T road south and 75 feet east of T road north, 3 feet west of corner fence post; iron post stamped "Prim. Trav. Sta. No. 97, 1915," elevation 191.215 feet	30 04 44.52	95 40 24.57	2,529
Rosehill schoolhouse, 1.9 miles east of; T road west	30 04 45.03	95 39 50.85	2,965
Rosehill schoolhouse, 2.15 miles east of, 75 feet north of center of road; 6 inches from corner post on fence line north, painted "U. S. B. M. 220"; copper nail in hub, elevation 177.83 feet	30 04 51.98	95 39 35.15	1,546
Tomball, 2.3 miles southwest of, on Rosehill Road, 25 feet west of center of road, 3 feet west of mail box, 2 feet east of corner fence post; 6 inches from telephone pole painted "U. S. B. M. 221"; copper nail in hub, elevation 174.52 feet	30 05 14.11	95 39 06.43	3,370
Tomball, 1.75 miles southwest of, 25 feet south of southwest corner of schoolhouse, 30 feet north of center of road, 2 feet from wire fence; iron post stamped "Prim. Trav. Sta. No. 98, 1915," elevation 180.446 feet	30 05 20.57	95 38 25.26	3,677
Tomball, 1 mile southwest of, 100 feet east of forks of road, 8 feet southwest of corner fence post; 6 inches from telephone pole painted "U. S. B. M. 222," elevation 187.07 feet	30 05 24.02	95 37 39.95	3,996

Northeast from Cypress along public road toward Louetta.

Cypress, 2.4 miles north and 3.75 miles east of, 110 feet N. 38° E., from crossroads, oak tree painted "U. S. B. M. 256"; copper nail in root, elevation 148.12 feet	30 00 14.70	95 38 06.52	5,739
Cypress, 3 miles north and 3.35 miles east of; church steeple	30 00 42.50	95 38 31.10	3,544
Cypress, 2.5 miles north and 4.3 miles east of; in pine timber, 15 feet south of road, near a road turning southerly; iron post stamped "Prim. Trav. Sta. No. 116, 1915," elevation 145.277 feet.	30 00 19.33	95 37 35.00	5,460

SETTEGAST QUADRANGLE.

Along highways and railroad in southwest quarter of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Houston, in second ward, 800 feet northwest of Houston Packing Co.'s plant, 1180 feet southwest of drawbridge over Buffalo Bayou, 35 feet northwest of San Antonio & Aransas Pass Ry. track; in root of oak tree, copper nail, painted "U. S. B. M. 215," elevation 39.66 feet	29 45 30.29	95 20 09.28	
Buffalo Bayou, center of San Antonio & Aransas Pass Ry. drawbridge; top of rail, elevation 41.2 feet	29 45 38.23	95 19 59.37	1,183
Buffalo Bayou, 2,373 feet southwest of drawbridge over, crossing of Galveston, Harrisburg & San Antonio Ry. and San Antonio & Aransas Pass Ry. branch; top of rail, elevation 46.0 feet	29 45 56.94	95 19 43.06	2,373
Houston, about 3,100 feet south of Lyons Avenue, 600 feet north of intersection of San Antonio & Aransas Pass Transfer and Southern Pacific tracks, 40 feet east of San Antonio & Aransas Pass tracks; in root of large oak tree painted "U. S. B. M. 216"; copper nail, elevation 47.07 feet	29 46 02.28	95 19 42.13	544
Intersection of San Antonio & Aransas Pass Transfer and Lyons Avenue car line tracks; top of rail, elevation 51.6 feet			
Concrete post on old city limit boundary, 300 feet south of Lyons Avenue, 700 feet east of San Antonio & Aransas Pass Transfer track; paint mark on top surface, elevation 50.58 feet			
Houston, in fifth ward, 50 feet south of Texas & New Orleans R. R. 15 feet east of line of tangent south, on branch of San Antonio & Aransas Pass Ry., 8 feet east of a pine tree 2 feet in diameter; iron post stamped "Prim. Trav. Sta. No. 95, 1915," elevation 50.999 feet	29 46 54.42	95 19 42.95	5,267
Houston, in fifth ward, 30 feet east of center of Clark Street at point 200 feet north of end of car line; 6 inches west of telephone pole, painted "U. S. B. M. 217;" copper nail in hub, elevation 52.01 feet	29 47 03.32	95 20 30.30	4,270
Houston, in Taylor Park, 270 feet west of Clark Street, opposite post on east side of street marked "City Limits"; a concrete monument about 8 inches square standing 15 inches above ground, in top of which is set a bronze tablet stamped "Prim. Trav. Sta. No. 96, 1915," elevation 53.382 feet	29 47 23.04	95 20 33.94	2,017
Houston, at city limits, 245 feet east of intersection of Hayes Street and East Montgomery road, at entrance to Hollywood Cemetery, 48 feet south of eats and west road; in root of pine tree painted "U. S. B. M. 250," copper nail, elevation 51.92 feet	29 47 21.56	95 21 34.59	5,346
Houston, intersection of Hogan and North Main streets	29 46 32.98	95 21 41.63	4,949
Houston, 280 feet northeast of south end of Missouri, Kansas & Texas Ry. trestle across White-oak Bayou, 3 feet south of sidewalk line on north side of west end of Hogan Street, where ground breaks off to bayou; iron post stamped "Prim. Trav. Sta. No. 113, 1915," elevation 44.341 feet	29 46 28.21	95 21 55.08	5,685
Houston, at northeast corner of Willow and Baker streets; in center of supporting pillar at southeast corner of building of Peden Iron and Steel Co., red metal disk (Coast and Geodetic Survey bench mark "J3"), elevation 45.006 feet			
Houston, in First Ward, intersection of Houston Avenue and Missouri, Kansas & Texas Ry. track	29 46 29.81	95 22 20.33	2,234

Along highways near west border of quadrangle.

Road crossing, 100 feet west of crossroads; top of rail, elevation 79.3 feet			
Aldine, 4.6 miles south of, 100 feet east of center of track, 25 feet east of center of road, 2 feet southwest of corner post on fence line east; copper nail in hub, brace painted "U. S. B. M. 245," elevation 74.775 feet	29 52 00.42	95 21 48.67	
Aldine, 5.50 miles south of, 30 feet east of center of track, 40 feet west of public road, 350 feet north of trestle, 2.5 feet east of telephone pole painted "U. S. B. M. 245"; copper nail in hub, elevation 72.26 feet	29 51 13.82	95 21 37.78	4,805
Houston, 3.80 miles north of city limits, 20 feet south and 60 feet east of road crossing, 25 feet west of center of road, 2.5 feet east of corner fence post; iron post stamped "Prim. Trav. Sta. No. 111, 1915," elevation 74.796 feet	29 50 36.62	95 21 28.37	3,850
Houston, 3.35 miles north of city limits, crossroads (no elevation)	29 50 14.32	95 21 22.52	2,313
Road crossing, International & Great Northern Ry. main track, 80 feet west of crossroads; top of rail, elevation 77.5 feet			
Houston, 2.75 miles north of city limits, 125 feet east of International & Great Northern Ry. track, 140 feet north and 80 feet east of road crossing; in root of pine tree painted "U. S. B. M. 247," copper nail, elevation 69.73 feet	29 49 42.68	95 21 14.31	3,276
Houston, 2.10 miles north of city limit, about 100 feet west of crossing of International & Great Northern Ry. and Houston Belt & Terminal Ry., about 25 feet north of Houston Belt & Terminal track, and 15 feet west of public road, 1 foot from crossing sign post painted "U. S. B. M. 248"; copper nail in hub, elevation 63.73 feet	29 49 10.09	95 21 08.45	3,333

SETTEGAST QUADRANGLE—Continued.

Along highways near west border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Houston, 2.10 miles north of city limit, crossing of International & Great Northern Ry. and Houston Belt Terminal Ry.	29 49 09.89	95 21 07.39	95
Houston, 1.6 miles north of city limit, 20 feet south of road, 65 feet east of road crossing, 3 feet east of corner fence post; iron post stamped "Prim. Trav. Sta. No. 112, 1915," elevation 59.485 feet	29 48 46.40	95 21 00.86	2,441
Houston, 0.6 mile north of city limit, 40 feet north of corner post on right-of-way fence, 24 feet west of center of track, 2.5 feet from telegraph pole; copper nail in stub of telegraph pole painted "U. S. B. M. 249," elevation 53.92 feet	29 47 54.44	95 20 48.78	5,355
Houston, 0.30 mile north of city limit, at intersection of Houston, East & West Texas Ry. and International & Great Northern Ry.	29 47 36.21	95 20 45.44	1,868

Along Beaumont, Sour Lake & Western Railway near Settegast.

Settegast, 1.75 miles northeast of, 20 feet east of a road crossing, 6 inches from crossing; signpost painted "U. S. B. M. 377," copper nail in hub, elevation 59.05 feet	29 52 16.60	95 16 06.54	.....
Settegast, about 3,000 feet northeast of, 150 feet northeast of north end of siding, 50 feet east of road crossing, 6 feet west of corner fence post; iron post stamped "Prim. Trav. Sta. No. 162, 1915," elevation 56.547 feet	29 51 29.78	95 16 54.26	6,328
Settegast, 0.25 mile southwest of, 70 feet southeast of center of track, opposite gate; pine tree painted "U. S. B. M. 378," copper nail in root, elevation 50.81 feet	29 50 57.52	95 17 27.09	4,358

Across country from Beaumont, Sour Lake & Western Railway to East Houston.

East Houston, 2.3 miles north and 1.6 miles west of, 15 feet west of a north and south ditch and in line with a ditch west, 40 feet north of a bridge over ditch, 15 inches west of a telephone pole painted "U. S. B. M. 379"; copper nail in hub, elevation 51.58 feet	29 50 26.32	95 17 13.24	3,380
East Houston, 1.6 miles north and 1.15 miles west of, 200 feet south of a small sawmill on slight knoll, 25 feet west of edge of pond; iron post stamped "Prim. Trav. Sta. No. 163, 1915," elevation 51.777 feet	29 49 51.77	95 16 47.34	4,170
East Houston, 1 mile north and 1.2 miles west of, at southeast corner of road bridge over east and west ditch, 1 foot from corner of bridge, painted "U. S. B. M. 380;" copper nail in hub, elevation 48.22 feet	29 49 21.39	95 16 56.85	3,084
East Houston, 0.2 miles north and 0.7 mile west of, 2,200 feet from road crossing on Texas & New Orleans Ry. in open prairie, 6 inches from a small pine tree painted "U. S. B. M. 381;" copper nail in hub, elevation 47.80 feet	29 48 46.02	95 16 19.06	4,540

From Settegast west to International & Great Northern Railway through woods and along road.

Settegast, about 1.15 miles north and 0.25 mile east of, in prairie near edge of timber, 40 feet west of a large ditch, at base of pine tree painted "U. S. B. M. 537"; copper nail in hub, elevation 61.59 feet	29 52 07.81	95 17 03.46	.....
Settegast, about 1.15 miles north and 0.5 mile west of, 160 feet west of a pole bridge over ditch, gum tree painted "U. S. B. M. 538"; copper nail in hub, elevation 64.68 feet	29 52 09.62	95 17 48.35	3,958
Settegast, 1 mile north and 1.5 miles west of, 20 feet south of road, and 25 feet southeast of corner of bridge over ditch 2.2 feet from corner fence post; iron post stamped "Prim. Trav. Sta. No. 221, 1915," elevation 68.920 feet	29 52 01.33	95 18 47.15	5,247
Settegast, 1 mile north and 2.3 miles west of, 1,630 feet east of Houston-Humble road, 50 feet north of center of road, pine tree painted "U. S. B. M 539"; copper nail in root, elevation 60.04 feet	29 51 59.08	95 19 36.83	4,382
Houston-Humble road, T road east from	29 51 58.47	95 19 55.50	1,647
Houston-Humble road, 30 feet east of, 400 feet northeast of a T road west, large pine tree painted "U. S. B. M. 540"; copper nail in root, elevation 61.55 feet	29 51 36.33	95 20 07.95	2,490
Houston-Humble road, 0.4 mile west of, 25 feet south and 20 feet east of second-class crossroads, inside fence, 4 feet from corner fence post; iron post stamped "Prim. Trav. Sta. No. 222, 1915," elevation 65,882 feet	29 51 32.72	95 20 34.82	2,396

SETTEGAST QUADRANGLE—Continued.

From Settegast west to International & Great Northern Railway through woods and along road—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Houston–Aldine road via Clark Street, T road east from	29 51 32.80	95 20 59.47	2,173
Houston–Aldine road via Clark Street, 75 feet east of, at point 400 feet south of angle in road, just south of vacant house; willow tree painted "U. S. B. M. 541" (tree used as gatepost); copper nail in root, elevation 66.78 feet	29 51 56.63	95 20 58.83	2,410
Near southeast corner of quadrangle.			
Green's siding, 2.4 miles south and 0.5 mile west of, at intersection of fence lines, north, east, south, and west 6 inches from corner fence post; painted "U. S. B. M. 410"; copper nail in hub, elevation 39.00 feet	29 46 49.62	95 15 04.73	.....
On public road along Texas & New Orleans Railroad.			
Green's siding, about 3,500 feet southwest of, 80 feet west of a bungalow, 40 feet south of road, 3 feet from fence; iron post stamped "Prim. Trav. Sta. No. 157, 1915", elevation 46.893 feet	29 48 51.98	95 15 06.83	.....
East Houston R. R. crossing, 770 feet northeast of, 35 feet north of road; large pine tree painted "U. S. B. M. 367"; copper nail in root, elevation 48.39 feet	29 48 29.63	95 16 00.49	5,239
East Houston, railroad crossing at	29 48 26.71	95 16 08.56	770
East Houston R. R. crossing, ¾ mile southwest of, 25 feet east of telephone pole painted "U. S. B. M. 368", west end of north abutment of concrete road culvert, chiseled square, elevation 46.20 feet	29 48 10.47	95 16 49.23	3,940
Englewood, 3,000 feet northeast of, about 230 feet north of crossing of St. Louis & San Francisco and Texas & New Orleans R. Rs., 35 feet south of road and 7 feet north of telephone pole painted "U. S. P. B. M."; iron post stamped "Prim. Trav. Sta. No. 158, 1915", elevation 45.800 feet	29 47 58.05	95 17 16.81	2,735
Englewood, 1,800 feet southwest of, 30 feet south of road; 2 feet from telephone pole, painted "U. S. B. M. 369"; copper nail in hub, elevation 49.88 feet	29 47 37.04	95 18 05.93	4,821
Englewood, 1.25 miles southwest of, 300 feet northeast of public road crossing Texas & New Orleans R. R., 6 inches from telephone pole painted "U. S. B. M. 370"; copper nail in hub	29 47 16.08	95 18 54.75	4,794
Aldine, 4.6 miles south of, 1.25 miles east of East Montgomery road, 100 feet east of center of International & Great Northern Ry., 25 feet east of center of public road, 2 feet southwest of corner fence post, painted; copper nail in hub	29 52 00.4	95 21 48.7	.....
Along highways near south border of quadrangle.			
Houston, on Clinton road, Galveston, Harrisburg & San Antonio Ry. and Houston Belt & Terminal Ry. crossing, 1,800 feet east of, 35 feet north and 40 feet east of T road corners at sign "Houston Harbor Additions," about 110 feet north of railway; in root of oak tree painted "U. S. B. M. 401"; copper nail, elevation 40.10 feet	29 45 24.81	95 17 38.82	.....
Houston Harbor, north side of turning basin, 80 feet south of Galveston, Harrisburg & San Antonio track, 230 feet southeast of dim road crossing, opposite forks of shell road; metal tablet in top of concrete monument (painted 134+418.5) U. S. E. D. B. M., elevation 42.005 feet	.....	.....	.....
Galveston, Harrisburg & San Antonio Ry. and Houston Belt & Terminal Ry. crossing	29 45 33.78	95 17 56.25	1,783
Houston, on Clinton road, Galveston, Harrisburg & San Antonio Ry. and Houston Belt & Terminal Ry. crossing, 2,800 feet west of, 60 feet north of public road crossing Galveston, Harrisburg & San Antonio Ry. and in line with public road east along railway; iron post stamped "Prim. Trav. Sta. No. 173, 1915," elevation 45.277 feet	29 45 44.04	95 18 26.34	2,848
Houston, on Clinton road, Galveston, Harrisburg & San Antonio Ry. and Houston Belt & Terminal Ry. crossing, 1.1 miles west of, 30 feet south of center of road, at fence line, in root of pine tree painted "U. S. B. M. 402"; copper nail, elevation 48.42 feet	29 45 41.21	95 19 13.57	4,226
Houston, about 550 feet north of crossing of Galveston, Harrisburg & San Antonio Ry. and San Antonio & Aransas Pass Ry., 40 feet east of San Antonio & Aransas Pass track, 3,100 feet south of Lyons Street; in root of large oak tree painted "U. S. B. M. 216"; copper nail, elevation 47.07 feet	29 46 02 28	95 19 42.13	2,755

SETTEGAST QUADRANGLE—Continued.

Along highways near southeast corner of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Green Bayou, 3.5 miles west of Lower Ferry, 20 feet south and 30 feet west of T road north, 18 inches west of corner fence post on old picket fence; copper nail in hub; post painted "U. S. B. M. 397," elevation 38.42 feet	29 46 01.50	95 15 04.50	
Fidelity addition, 1.6 miles north of Clinton Road, 0.3 mile east of graded road north, in group of oak trees with open prairie northwest; in root of oak tree painted "U. S. B. M. 398"; copper nail, elevation 36.54 feet	29 45 21.69	95 15 02.54	4,024

Near Houston.

Houston, Sims Avenue and Opollusus Street, northwest corner of concrete footing of water tank of Moncrief-Lenoir Manufacturing Co.; chiseled square painted "U. S. 54.2 B. M.," elevation 54.18 feet			
Englewood, 1.25 miles southwest, about 360 feet southwest of signal tower, 250 feet northeast of road crossing, on north side of Texas & New Orleans R. R. track, top of concrete base of semaphore signal; chiseled square, elevation 51.64 feet			
Englewood, opposite operator's window, top of nearest rail, elevation 51.7 feet			
Settegast, opposite station signpost, top of nearest rail, elevation 56.7 feet			
Houston-Humble road, about 4 miles north of city limits, 100 feet southwest of T road east toward Settegast, west end of concrete and brick culvert; chiseled square painted "U. S. 62.4 B. M.," elevation 62.50 feet			
Houston-Aldine road, about 8 miles northwest of Houston city limits, 0.25 mile south of vacant house, on top of east end of concrete culvert over drainage ditch; chiseled square, culvert painted "U. S. 68.9 B. M.," elevation 68.97 feet			
Houston, city limits, 3.9 miles northwest of, 1 mile northwest of forks of Houston-Humble road and Houston-Aldine road, on the latter road, 30 feet west of lone pine tree, in top of east end of concrete culvert; chiseled square, elevation 71.69 feet			

Along left bank of Buffalo Bayou.

These bench marks are probably all bronze tablets marked "U. S. Engineers Department," set in top of concrete posts, 6 inches square on top and protruding above the ground. The letters R and L of the descriptions refer to right and left bank going down stream and the distance given are probably the approximate distances from the bank.			
Houston Harbor north side of turning basin, 80 feet south of Galveston, Harrisburg & San Antonio Ry. track 230 feet southeast of dim road, marked "134+418 300′ L" 42.005 feet			
Station No. 133+792, 300′ L. 37.928 feet			
Station No. 133+024, 300′ L. 40.308 feet			

Magnetic declination near south border of quadrangle, 8° 18′ E.

SPRING QUADRANGLE.

Along International & Great Northern Railway.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Spring, 4.85 miles west of, 380 feet east of mile post 5 22 feet south of road crossing at "Rotherwood spur," 1 foot from crossing signboard painted "U. S. B. M. 229"; copper nail in hub, elevation 143.78 feet	30 05 39.82	95 29 45.89	3,418
Road crossing; top of rail, elevation 141.5 feet			
Spring, 3.80 miles west of, 500 feet east of milepost 4, 18 feet south of track at road crossing signpost; copper nail in hub; 1 foot north of post, painted on cattle guard "U. S. B. M. 230," elevation 136.38 feet	30 05 28.96	95 28 44.73	5,484

SPRING QUADRANGLE—Continued.

Along International & Great Northern Railway—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Spring, 3.25 miles west of, 1,900 feet west of milepost 3, 45 feet south and 15 feet west of road crossing, 3 feet from corner fence post; iron post stamped "Prim. Trav. Sta. No. 103, 1915," elevation 140.603 feet	30 05 22.72	95 28 11.33	3,002
Spring, 2.30 miles west of, 2,300 feet west of milepost 2, 32 feet south of track; 1 foot from telegraph pole painted "U. S. B. M. 231"; copper nail in hub, elevation 135.08 feet	30 05 13.04	95 27 16.24	4,940
Spring, 1.40 miles west of, 2,300 feet east of milepost 2, 970 feet west of road crossing, 30 feet south of track; 6 inches from telegraph pole painted "U. S. B. M. 232"; copper nail in hub, elevation 131.17 feet	30 05 03.86	95 26 24.71	4,621
Spring, 1 mile west of, 500 feet west of milepost 1, 66 feet north of track at private road crossing, 4 feet from post at west end of gate; iron post stamped "Prim. Trav. Sta. No. 104, 1915," elevation 128.903 feet	30 05 00.34	95 26 00.48	2,161
Spring station, 100 feet north of International & Great Northern Ry. depot, 50 feet west of main line track; 1 foot west of telegraph pole painted "U. S. B. M. 233"; copper nail in hub, elevation 120.63 feet	30 04 45.84	95 25 01.92	5,350
Along public road.			
Spring, 0.9 mile south of, 60 feet west of track, 25 feet east of road, 1 foot west of center post under shanty painted red; copper nail in hub; post painted "U. S. B. M. 234," elevation 118.40 feet	30 03 59.35	95 24 50.32	4,806
Spring, 2 miles south of, 52 feet west of track, 30 feet east of center of road, 20 feet north of gate; iron post stamped "Prim. Trav. Sta. No. 105, 1915," elevation 109.802 feet	30 03 06.69	95 24 37.18	5,443
Spring, 2.90 miles south of, 55 feet west of road crossing, 30 feet east of road, 1 foot west of corner fence post; copper nail in hub, painted on fence brace, "U. S. B. M. 235," elevation 92.44 feet	30 02 18.20	95 24 25.05	5,015
International & Great Northern Ry. bridge No. 275, top of rail directly above Cypress Creek, elevation 92.1 feet			
Westfield, 1,200 feet north of, 30 feet west of center of road, corner post on fence line west; 6 inches east of corner post painted "U. S. B. M. 236"; copper nail in hub, elevation 106.19 feet	30 01 30.88	95 24 13.94	4,879
Westfield, T road corners at, shell road west	30 01 20.78	95 24 11.04	1,052
Westfield, 1,050 feet south of, 65 feet south and 60 feet west of public-road crossing International & Great Northern Ry., 4 feet north of corner fence post; iron post stamped "Prim. Trav. Sta. No. 106, 1915," elevation 108.090 feet	30 01 09.20	95 24 08.07	1,196
Westfield, 1.1 miles south of, 30 feet west of center of road, about 50 feet east of center of track, 250 feet southeast of International & Great Northern Ry. bridge 277; copper nail in hub; witness stake painted "U. S. B. M. 237," elevation 100.99 feet	30 00 23.43	95 23 55.19	4,760
From Rotherwood spur, International & Great Northern Railway, north along second-class road through woods. (Unchecked spur line.)			
Rotherwood spur, 0.9 mile north of, about 800 feet south of crossing of Willow Creek, 10 feet west of road, in root of large oak tree painted "U. S. B. M. 299"; 4 feet north of body of tree, copper nail, elevation 122.62 feet	30 06 25.38	95 29 31.99	
Rotherwood spur, 1.7 miles north of, 0.6 mile north of Willow Creek crossing, 15 feet east of road; in root of oak tree painted "U. S. B. M. 300"; copper nail, elevation 124.64 feet	30 07 02.23	95 29 49.00	
Along public road from Spring southwest toward Klein.			
Spring, 0.7 mile west of, 300 feet north of shell road and 150 feet east of a white house; large leaning oak tree painted "U. S. B. M. 473"; copper nail in root, elevation 124.70 feet	30 04 38.96	95 25 49.39	
Spring, 1.1 miles west and 1,800 feet south of crossroads	30 04 27.94	95 26 09.65	2,100
Spring, 1.5 miles west and 3,000 feet south of, 25 feet north of center of road; 1 foot south of west gatepost and corner post on fence line north painted "U. S. B. M. 474"; copper nail in hub, elevation 122.88 feet	30 04 15.92	95 26 33.04	2,388
Spring, 2.4 miles west and 1 mile south of, 1,000 feet east of a grove of trees on south side of road, 25 feet south of center of road; iron post stamped "Prim. Trav. Sta. No. 197, 1915," elevation 130.216 feet	30 03 54.35	95 27 25.58	5,107

SPRING QUADRANGLE—Continued.

Along public road from Spring Southwest toward Klein—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Spring, 3.25 miles west and 1.25 miles south of, 150 feet east of bend in road, 80 feet south of road; in open prairie; small gum tree painted "U. S. B. M. 475"; copper nail in root, elevation 129.88 feet	30 03 41.28	95 28 17.90	4,785
Spring, 4 miles west and 1.65 miles south of, on north bank of small creek, 60 feet east of bridge, 40 feet south of road; gum tree painted "U. S. B. M. 476"; copper nail in root, elevation 122.15 feet	30 03 19.48	95 28 58.06	4,160
Spring, 4.5 miles west and 2 miles south of, in open prairie, 10 feet north and 25 feet west of crossroads; iron post stamped "Prim. Trav. Sta. No. 198, 1915," elevation 133.855 feet	30 03 00.20	95 29 33.79	3,696
Near south border of quadrangle.			
Pemble's store, 0.7 mile southwest of, at east end of a pond, 20 feet southeast of center of road; gum tree painted "U. S. B. M. 273"; copper nail in root, elevation 118.22 feet	30 00 04.32	95 28 24.46	.....
Pemble's store, at intersection of west fork of East Montgomery Road and Erhart road, 10 feet east and 20 feet north of crossroads; 6 inches from corner fence post painted "U. S. B. M. 274"; copper nail in hub, elevation 117.84 feet	30 00 24.28	95 27 49.12	3,705
From Westfield east on road to Humble.			
Westfield, about 1 mile east of, 425 feet northwest of school building district No. 29, 20 feet south of center of road; pine tree painted "U. S. B. M. 308"; copper nail in root, elevation 108.83 feet	30 01 15.97	95 23 12.76	.....
Westfield, 1.4 miles east of; crossroads	30 01 11.93	95 22 48.15	2,201
From Spring east on road to Bender Lake.			
Spring, 0.5 mile south and 0.7 mile east of, in woods, 40 feet north of road; pine tree 2 feet in diameter painted "U. S. B. M. 303"; copper nail in root, elevation 119.86 feet	30 04 21.39	95 24 21.13	.....
Spring, 0.7 mile south and 1.4 miles east of, 400 feet southeast of angle in road rounding fence corner, 15 feet southwest of road; gum tree painted "U. S. B. M. 304"; copper nail in root, elevation 114.73 feet	30 04 08.82	95 23 36.30	4,139
Spring, 0.9 mile south and 2.2 miles east of, in woods, 15 feet west of road; large oak tree painted "U. S. B. M. 305," copper nail in root, elevation 109.71 feet	30 03 59.70	95 22 49.14	4,246

LA PORTE QUADRANGLE.

Along public road from Deer Park to La Porte.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Deer Park, 160 feet north of Southern Pacific R. R. track, 25 feet north and 15 feet west of crossroads, inside plank railing at culvert; iron post stamped "Prim. Trav. Sta. No. 32, 1915," elevation 36.332 feet	29 42 40.62	95 07 26.59	.....
Deer Park, 0.6 mile east of, 350 feet east of wooden bridge, on north side of road; copper nail in hub, painted "U. S. B. M. 'A.,'" elevation 33.89 feet	29 42 36.36	95 06 49.90	3,265
Thayer triangulation station (U. S. Engineers), about 1.25 miles east of Deer Park station, 467 feet S. 4° E. (true) from road crossing Southern Pacific R. R. between cattle guards 18A and 18B; iron post stamped "U. S. E. D.," reference mark, iron post 124.4 feet southwest (north fererence mark not found), elevation 39.301 feet	29 42 19.96	95 06 13.90	3,582
Deer Park, 2.1 miles southeast of, 25 feet south of road; 1 foot south of telephone pole, painted "U. S. B. M. 495"; copper nail in hub, elevation 39.84 feet	29 42 10.68	95 05 26.62	4,272
Deer Park, 3 miles southeast of, 25 feet south of road; 6 inches south of telephone pole painted "U. S. B. M. 496"; copper nail in hub, elevation 36.03 feet	29 41 56.18	95 04 38.57	4,482

LA PORTE QUADRANGLE—Continued.

Along public road from Deer Park to La Porte—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Deer Park, 3.6 miles southeast of, 75 feet S. 34° E. of road crossing of Southern Pacific R. R., 3 feet south of right-of-way fence; iron post stamped "Prim. Trav. Sta. No. 204, 1915," elevation 35.866 feet	29 41 43.44	95 03 59.96	3,639
La Porte, 1.8 miles north and 2 miles west of, 30 feet south of Southern Pacific R. R., 35 feet north of road; 6 inches south of telephone pole painted "U. S. B. M. 497"; copper nail in hub, elevation 30.18 feet	29 41 27.87	95 03 07.61	4,877
La Porte, 1.4 miles north and 1.65 miles west of, about 1,500 feet southwest of Strang station, 30 feet north and 20 feet east of crossroads; small ash tree painted "U. S. B. M. 498"; copper nail in root, elevation 27.98 feet	29 41 07.88	95 02 48.44	2,632
La Porte, 0.3 mile north and 1.6 miles west of, about 2,000 feet north 62° west from La Porte station, 25 feet east of center of road, opposite a T road west; iron post stamped "Prim. Trav. Sta. No. 205, 1915," elevation 28.829 feet	29 40 11.87	95 02 47.07	5,658
La Porte, 1.2 miles west of, about 140 feet south of La Porte Ry. station and 50 feet east of railroad track; 30 feet south of public road and 8 inches north of telephone pole painted "U. S. B. M. 499"; copper nail in hub, elevation 25.66 feet	29 39 53.27	95 02 20.27	3,019
La Porte, 1,650 feet west of road forks, 4,600 feet east of railroad track, 30 feet south of road; 6 inches north of telephone pole painted "U. S. B. M. 500"; copper nail in hub, elevation 27.41 feet	29 39 54.17	95 01 28.27	4,587
La Porte, forks of road at; roads to Seabrook, Sylvan Beach, Morgans Point, and Houston	29 39 54.79	95 01 09.54	1,652
La Porte, 3,300 feet northeast of forks of road, south end of concrete culvert, west end of wall; railing painted "U. S. B. M. 519"; chiseled square, elevation 23.92 feet	29 40 10.40	95 00 36.15	3,340
La Porte, at intersection of Main Street, Broadway and San Jacinto Avenue, in top of post 1 foot high; copper nail painted "U. S. 26.3 B. M.," elevation, 26.28 feet			

Along La Porte-Seabrook road.

La Porte, 0.7 mile south of, 0.5 mile west of Sylvan station, 200 feet north of a house, 25 feet west of road and 80 feet north of a lane west; iron post stamped "Prim. Trav. Sta. No. 206, 1915," elevation 22.264 feet	29 39 18.41	95 01 09.00	
La Porte, 1.4 miles south of, 300 feet south of Little Cedar Bayou, 45 feet east of road; oak tree painted "U. S. B. M. 501"; copper nail in root, elevation 16.92 feet	29 38 41.84	95 01 07.41	3,697
La Porte, 2.25 miles south of, 600 feet south of second-class cross-road, 25 feet east of road; cedar tree painted "U. S. B. M. 502"; copper nail in root, elevation 16.20 feet	29 37 57.32	95 01 06.62	1,500

Along Lynchburg-Deer Park road.

San Jacinto battle field, 2,000 feet south of, 22 feet east of center of road; in root of hackberry tree painted "U. S. B. M. 403"; copper nail, elevation 25.13 feet	29 44 46.76	95 05 23.79	
San Jacinto battle field, 1.4 miles south of, 10 feet south and 25 feet east of T road west; 6 feet north of telephone pole; iron post stamped "Prim. Trav. Sta. No. 174, 1915," elevation 33.833 feet	29 43 58.70	95 05 23.20	4,854
Deer Park, about 1.1 miles north and 1.2 miles east of, 60 feet southeast of center of road, in pasture; in root of one of a group of seven trees; copper nail; tree painted "U. S. B. M. 404"	29 43 46.00	95 06 17.94	4,995
Deer Park, 1 mile north and 0.5 mile east of, 25 feet southeast of center of road, close to wire fence line; in root of oak tree painted "U. S. B. M. 405"; copper nail, elevation 30.68 feet	29 43 31.76	95 06 59.85	3,964

In northwest corner of quadrangle.

Cedar Bayou post office, 0.75 mile south and 5.7 miles west of, 50 feet east of a house on north side of road, 25 feet north of road; oak tree painted "U. S. B. M. 437"; copper nail in root, elevation 29.39 feet	29 44 53.64	95 00 30.28	
Cedar Bayou post office, 0.75 mile south and 6.5 miles west of, 20 feet north of road at wire fence line; oak tree painted "U. S. B. M. 438"; copper nail in root, elevation 30.41 feet	29 44 53.55	95 01 18.48	4,250
Cedar Bayou post office, 0.75 mile south and 7 miles west of, T road corners	29 44 54.32	95 01 53.32	3,074

LA PORTE QUADRANGLE—Continued.

Near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Deer Park, 5.9 miles south and 1.4 miles east of, on Red Bluff road, 50 feet west of road at edge of timber, prairie on east; oak tree painted "U. S. B. M. 536," copper nail in root, elevation 20.99 feet	29 37 33.29	95 06 02.01	.....
Deer Park, 5.4 miles south of, 0.5 mile west of Red Bluff road, 600 feet south of dwelling house, 25 feet north of roadway, 600 feet west of Middle Bayou, 2 feet south of corner fence post; copper nail in hub; post painted "U. S. B. M. No. 59," elevation 23.18 feet	29 38 00.35	95 06 56.51	5,533
Deer Park, 5.25 miles south and 1 mile east of, on Red Bluff road, about 0.4 mile east of Middle Bayou, 30 feet east of road, 4 feet east of fence line in field; copper nail in hub; witness stake painted "U. S. B. M. No. 60," elevation 25.05 feet	29 38 05.22	95 06 28.29	2,540
Deer Park, 4.6 miles south and 0.4 mile east of, on Red Bluff road, 30 feet west of center of road, 100 feet north of fence corner and lane southwest; 6 inches from fence post painted "U. S. B. M. No. 61"; copper nail in hub, elevation 25.93 feet	29 38 40.31	95 06 59.72	4,501
Deer Park, 4.2 miles south of, 150 feet north of Mr. English's house, 30 feet west of road, 1.5 feet from wire fence line; iron post stamped "Prim. Trav. Sta. No. 30, 1915," elevation 31.411 feet	29 39 01.48	95 07 18.38	2,698
Deer Park, 3.35 miles south, 0.4 mile east of, 0.9 mile east of intersection of Red Bluff road and Main Street, La Porte road, 25 feet south of center of east and west road, 1.5 feet from wire fence; copper nail in hub; witness stake painted "U. S. B. M. No. 63," elevation 36.54 feet	29 39 48.57	95 07 03.48	4,934
Deer Park, 2.35 miles south of, 10 feet east of old trail on open prairie; iron post stamped "Prim. Trav. Sta. No. 31, 1915," witness stake painted "U. S. P. B. M.," elevation 41.162 feet	29 40 39.00	95 07 23.58	5,394
Deer Park, 1.5 miles south of, 10 feet west of dim roadway on open prairie; copper nail in hub; witness stake painted "U. S. B. M. No. 64," elevation 39.70 feet	29 41 23.53	95 07 24.77	4,499
Deer Park, 0.7 mile south of; on west side of road, at edge of embankment made by ditch excavation; copper nail in hub; witness stake painted "U. S. B. M. No. 65," elevation 37.47 feet	29 42 02.17	95 07 25.64	3,904
Deer Park, 1.6 miles north of; on north side of ship channel, U. S. Engineers' bench mark, station 67+653; tablet in top of concrete monument 6 inches square, elevation, determined from leveling by U. S. Corps of Engineers, 7.140 feet	29 44 02.84	95 07 24.68	.....

Along Buffalo Bayou.

These bench marks are probably all bronze tablets marked "U. S. Engineer Department," set in top of concrete posts, 6 inches square on top and protruding above ground. The letters R and L of the descriptions refer to right and left bank going downstream and the distances given are probably the approximate distances from the bank.			
Station 66+436 300 L, elevation, 3.626 feet	.....	.....	.....
Station 65+553 300 L, elevation, 5.382 feet	.....	.....	.....
Station 64+053 300 L, elevation, 8.016 feet	.....	.....	.....

Magnetic declination for quadrangle, 8° 10′ E.

STUEBNER QUADRANGLE.

Along highways in south part of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Hufsmith, International & Great Northern Ry. crossing; top of rail, elevation 170.0 feet	.....	.....	.....
Hufsmith, 0.75 mile north of, 400 feet south of bridge over Spring Creek, 15 feet west of public road; gum tree painted "U. S. B. M. 260"; copper nail in root, elevation 151.09 feet	30 07 57.40	95 35 47.71	.....
Hufsmith, about 0.8 mile north and 0.7 east of, along a woods road near Spring Creek, 20 feet south of road and 120 feet west of a bridge over ravine; oak tree painted "U. S. B. M. 261"; copper nail in root, elevation 150.93 feet	30 08 02.26	95 35 12.92	3,094

STUEBNER QUADRANGLE—Continued.

Along highways in south part of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Hufsmith, 0.8 mile north and 0.7 mile east of, just on north side of road; iron bar 2.5 inches in diameter and standing 3 feet high, probable land corner	30 08 02.50	95 35 04.62	730
Hufsmith, 0.9 mile north and 1 mile east of, along road near Spring Creek, 250 feet southwest of cabin, 20 feet north of road, 12 feet west of oak tree and 3 feet from fence corner; iron post stamped "Prim. Trav. Sta. No. 118, 1915," elevation 177.882 feet	30 08 07.05	95 34 46.54	1,653
Stuebner (post office discontinued), 250 feet east of, 30 feet north of center of road, iron bar about 1¼ inches square and standing 1 foot above ground; pine tree near, painted "U. S. B. M. 262"; top of bar, elevation 182.35 feet	30 07 47.60	95 34 14.46	3,435
Stuebner, 0.7 mile east of, 20 feet south of center of road; pine tree painted "U. S. B. M. 263"; copper nail in root, elevation 172.28 feet	30 07 51.26	95 33 32.08	3,741
Stuebner, 1 mile east of, 1.5 miles south of crossing of Spring Creek, 25 feet east of center of road at T road west; iron post stamped "Prim. Trav. Sta. No. 119, 1915," elevation 165.409 feet	30 07 51.77	95 33 11.83	1,779

Near southeast corner of quadrangle.

Rotherwood spur, International & Great Northern Ry., 2.15 miles north and 0.6 mile west of, 2,000 feet northwest of a house, 600 feet north of woods road, along old trail; tree painted "U. S. B. M. 302"; copper nail in root (no elevation determined)	30 07 32.04	95 30 22.07	.....

Magnetic declination, 8° 35′ E.

SUGARLAND QUADRANGLE.

Near Missouri City.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Missouri City station, opposite southwest end of, 90 feet from public road crossing over track, 30 feet north of center of main road to Houston, 1 foot from right-of-way fence line; iron post stamped "Prim. Trav. Sta. No. 16, 1915," elevation 80.250 feet	29 37 07.35	95 32 17.34	.....
Missouri City, 0.8 mile northeast of, 300 feet east of public road crossing, 40 feet northwest of Houston Road, and about 40 feet from center of Southern Pacific R. R. track, 2 feet from telephone pole painted "U. S. B. M. No. 31"; copper nail in hub, elevation 71.98 feet	29 37 25.47	95 31 30.75	4,501

SWANSON QUADRANGLE.

Along highways north through center of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Katy, 6.6 miles north of, 20 feet east of center of road, 0.5 mile north of white schoolhouse, 6 inches from corner fence post at fence line east; copper nail in hub; post painted "U. S. B. M. 102," elevation 163.46 feet	29 52 54.34	95 49 25.10	.....
Katy, 7.5 miles north of, 20 feet east of center of road, 1 foot from corner fence post at north end of gate; copper nail in hub; post painted "U. S. B. M. 103," elevation 171.64 feet	29 53 42.91	95 49 25.57	4,906
Katy, 8.1 miles north and 0.2 mile east of, in line with private road north, 20 feet south of center of east and west road, close to corner fence post at fence line south; iron post stamped "Prim. Trav. Sta. No. 50, 1915," elevation 165.046 feet	29 54 12.70	95 49 10.92	3,274

SWANSON QUADRANGLE—Continued.

Along highways north through center of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Katy, 8.1 miles north by 1 mile east of, 27 feet south by 26 feet west of post set at intersection of roads, 2 feet north of corner fence post; copper nail in hub; post painted "U. S. B. M. 104," elevation 159.42 feet	29 54 12.97	95 48 26.46	3,915
Katy, 9 miles north by 1 mile east of, on west side of dim road, 6 inches from fence post; copper nail in hub; post painted "U. S. B. M. 105," elevation 162.21 feet	29 55 01.13	95 48 26.83	4,865
Katy, 10 miles north by 1 mile east of, 815 feet north of fence corner, 3 feet west of north and south fence line and 20 feet east of dim roadway; iron post stamped "No. 51, 1915," elevation 164.283 feet	29 55 49.65	95 48 27.19	4,900
Katy, 10.9 miles north by 1 mile east of, 1,900 feet south of Big Cypress Creek, 30 feet west of center of roadway, 6 inches from fence post; copper nail in hub; post painted "U. S. B. M. 106," elevation 160.93 feet	29 56 40.07	95 48 28.94	5,095
Katy, 11.3 miles north by 1 mile east of, 100 feet north of Big Cypress Creek, 25 feet north by 5 feet west of northwest corner of bridge on west side of road; copper nail and washer in root of water oak; corner of bridge painted "U. S. B. M. 107," and with an arrow, elevation 157.24 feet	29 57 00.11	95 48 29.46	2,024
Katy, 12.4 miles north by 1 mile east of, 1.1 miles north of Big Cypress Creek, 3.2 miles south of Houston & Texas Central R. R., 30 feet east of center of road, 2 feet from tall fence post; iron post stamped "Prim. Trav. Sta. No. 52, 1915," elevation 168.080 feet	29 57 95.22	95 48 30.11	5,971
Katy, 13.4 miles north by 1 mile east of, 2.1 miles north of Big Cypress Creek, 2.2 miles south of Houston & Texas Central R. R., 30 feet west of center of road, 6 inches from fence corner and gatepost; copper nail in hub; post painted "U. S. B. M. 108," elevation 180.23 feet	29 58 50.80	95 48 31.25	5,212
Katy, 14.4 miles north by 1 mile east of, 3.1 miles north of Big Cypress Creek, 30 feet east by 25 feet south of T road south, 1 foot from corner fence post; copper nail in hub; fence painted "U. S. B. M. 109," elevation 198.36 feet	29 59 42.58	95 48 32.36	5,231
Hockley, 6.5 miles south by 1.2 miles east of, 4,500 feet west of Katy and Hockley road, in open prairie; copper nail in hub with witness stake painted "U. S. B. M. 183," elevation 163.30 feet	29 55 42.25	95 49 18.05	.....
Hockley, 6.5 miles south by 0.6 mile east of, near gateway on a private road across prairie to Hockley, at north end of lane and near the head of timber on Big Cypress Creek, 6 feet west of gatepost and close to wire fence line; copper nail in hub; painted on gate "U. S. B. M. 184," elevation 166.02 feet	29 55 39.60	95 49 56.58	3,400
Hockley, 6 miles south of, about 0.8 mile northwest of head of timber of Big Cypress Creek, 4 feet southeast of gatepost at double gateway; iron post stamped "Prim. Trav. Sta. No. 81, 1915," elevation 169.512 feet	29 56 04.33	95 50 38.05	4,422
Hockley, 6 miles south by 1 mile west of, on prairie, 5 feet east of corner post on fence line north, 50 feet north of a jog west in fence line; copper nail in hub; post painted "U. S. B. M. 185," elevation 171.78 feet	29 56 03.52	95 51 44.77	5,870

Near Swanson.

Hockley, 4.5 miles southeast of, 0.6 mile northwest of Swanson, 0.6 mile southeast of section house, nearly opposite milepost 31, 55 feet north of Houston & Texas Central R. R. track, 25 feet south of shell road, 2.5 feet north of telephone pole; iron post stamped "Prim. Trav. Sta. No. 54, 1915," elevation 194.546 feet	29 59 57.98	95 46 21.62	.....
Swanson, 1,500 feet east of station signboard on Houston & Texas Central R. R., 25 feet south of center of shell road, 50 feet north of track, 600 feet west of milepost 30, 6 inches from telephone pole; copper nail in hub; pole painted "U. S. B. M. 113," elevation 187.62 feet	29 59 40.08	95 45 34.24	4,542

Magnetic declination in quadrangle, 8° 45′ E.

WALLER QUADRANGLE.

Along public roads in southeast quarter of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Hockley, 2.70 miles northwest of, 15 feet south of center of road, 4 feet from west end and in top of south abutment of concrete culvert; bronze tablet stamped "Prim. Trav. Sta. No. 79, 1915," elevation 246.121 feet	30 02 30.80	95 53 11.43	4,383
Waller, 1.75 miles southeast of, about 100 feet west and 65 feet south of road crossing Houston & Texas Central R. R., 30 feet south of public road; in root of sycamore tree painted "U. S. B. M. 181"; copper nail, elevation 262.58 feet	30 02 48.33	95 53 58.61	4,509
Waller, 1.20 miles southeast of, crossroads	30 03 00.36	95 54 29.99	3,013
Waller, 0.80 mile southeast of, 25 feet south of center of road; 1 foot from telephone pole, close to fence line, painted "U. S. B. M. 182"; copper nail in hub, elevation 264.54 feet	30 03 08.39	95 54 51.76	2,078
Waller station, about 1,900 feet southeast of, 47 feet south of Houston & Texas Central R. R., 23 feet southeast of county line post, 2.5 feet north of fence line; iron post stamped "Prim. Trav. Sta. No. 80, 1915," elevation 241.632 feet	30 03 16.48	95 55 16.59	2,330
Waller station, about 1,885 feet southeast of, about 30 feet south of Houston & Texas Central R. R.; post marked "Harris County-Waller County"	30 03 16.68	95 55 16.74	23
Waller, 0.6 mile north of, 20 feet east of road, at corner of fence where lane turns east, 6 inches from corner fence post; copper nail in hub; post painted "U. S. B. M. 192," elevation 266.29 feet	30 03 56.36	95 55 16.31	4,049
T road west, 200 feet north of, top of east end of small wooden culvert, elevation 265.10 feet	.....	.....	.....
Waller, 1.6 miles north of, 25 feet south and 25 feet east of T road east; 6 inches from corner fence post painted "U. S. B. M. 193"; copper nail in hub, elevation 274.06 feet	30 04 46.98	95 55 17.33	5,114
Waller, 2.4 miles north of, in line with road north at east end of 300 foot jog, 3 feet north of wire fence, 8 feet west of telephone pole; iron post stamped "Prim. Trav. Sta. No. 85, 1915," elevation 271.605 feet	30 05 21.92	95 55 14.56	3,539
Waller, 3.4 miles north of, 20 feet east of road, at corner post on fence line east; 6 inches from fence post painted "U. S. B. M. 194"; copper nail in hub, elevation 276.83 feet	30 06 13.59	95 55 15.42	5,220
Waller, about 2.9 miles north of and 0.5 mile east of, 920 feet north of T road east and 960 feet north of T road west, 20 feet east of road, 1 foot from corner post on fence line east; copper nail in hub "U. S. B. M. 195," elevation 286.72 feet	30 06 42.05	95 54 55.36	3,370
Waller, 4.7 miles north and about 0.5 mile east of, 0.5 mile south of Harris-Montgomery county line, at T road south and in line with road south, 2 feet south of wire fence; iron post stamped "Prim. Trav. Sta. No. 86, 1915," elevation 273.244 feet	30 07 25.68	95 54 56.38	4,409
Waller, 3.7 miles north and 1.6 mile east of, 25 feet north of center of road, 100 feet west of point in road opposite Bentford schoolhouse, at east gate post; 6 inches from post painted "U. S. B. M. 196"; copper nail in hub, elevation 271.04 feet	30 06 33.83	95 53 45.59	8,132
Waller, 3.75 miles north and 1.80 miles east of, crossroads	30 06 33.82	95 53 31.97	1,196
Waller, 3.75 miles north and 2.5 miles east of, 400 feet north of old two-story house, 25 feet north of center of road; 6 inches from fence post with 2-inch by 4-inch timber supporting telephone wire painted "U. S. B. M. 197"; copper nail in hub, elevation 268.49	30 06 34.35	95 52 59.77	2,830
Waller, 3.7 miles north and 2.7 miles east of, 20 feet east of T road west, 3 feet from north and south fence line; iron post stamped "Prim. Trav. Sta. No. 87, 1915," elevation 266.894 feet	30 06 34.37	95 52 41.25	1,627
Hockley, 4.7 miles north and 1.7 miles west of, 25 feet west of center of road, 60 feet north of bridge, at corner of fence on road west; 6 inches from post painted "U. S. B. M. 198"; copper nail in hub	30 05 43.76	95 52 40.80	5,114
Hockley, 3.7 miles north and 1.7 miles west of, 20 feet west and 15 feet south of T road east, 25 feet north of Charles Schultz's mail box; copper nail in hub, "U. S. B. M. 199," elevation 274.12 feet	30 04 53.61	95 52 39.79	5,066

From point near southeast corner of quadrangle north to point 1.7 miles west of Hockley.

Hockley, 1.3 miles south by 2.5 miles west of, 1 mile south of T road south 6 inches from corner post on fence line east; copper nail in hub; post painted "U. S. B. M. 190," elevation 230.83 feet	30 00 24.40	95 52 54.64	.....
Hockley, 0.2 mile south by 2.5 miles west of, at T road south, in line with road south, 20 feet north of center of east and west road, 2 feet from wire fence; iron post stamped "Prim. Trav. Sta. No. 84, 1915," elevation 235.066 feet	30 01 17.38	95 52 56.15	5,354

Magnetic declination for southeast quarter of quadrangle, 8° 30′ E.

WALLEY QUADRANGLE.

On unchecked spur line.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Crosby, about 6.3 miles northeast of, on road to Liberty, 125 feet south of Texas & New Orleans R.R., 250 feet west of bridge across Cedar Bayou, 30 feet south of public road and 6 feet north of wire fence; iron post stamped "Prim. Trav. Sta. No. 202, 1915," elevation 54.666 feet	29 58 14.90	94 59 16.33	.....

Magnetic declination for quadrangle, 8° 23′ E.

WEBSTER QUADRANGLE.

Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Genoa station, Galveston & Houston Electric Ry., 90 feet east and 30 feet south of road crossing, 35 feet south of center of road, 2 feet east of right-of-way fence; iron post stamped "Prim. Trav. Sta. No. 27, 1915," elevation 49.112 feet	29 37 22.32	95 12 57.20	.....
Genoa station, Galveston, Houston & Henderson R. R., about 440 feet north of, 60 feet west of track, 6 feet outside right-of-way fence; 3 feet from telephone pole painted "U. S. B. M. 55"; copper nail in hub (no elevation)	29 37 25.06	95 11 54.95	5,500
Genoa station, Galveston, Houston & Henderson R. R., 180 feet north of, 25 feet west of center of track, on south side of water tank, in concrete foundation; bronze tablet; no elevation; stamped "C. and G. S. B. M. R8," elevation 49.846 feet	29 37 23.36	95 11 53.03	242

Along public road between Webster and Genoa.

Webster, about 0.75 mile northwest of, 40 feet northeast of center of road; 1 foot west of telephone pole painted "U. S. B. M. 511"; copper nail in hub, elevation 27.921 feet	29 32 44.50	95 07 31.63	.....
Webster, 1.6 miles northwest of, 55 feet southwest of center of Galveston, Houston & Henderson Ry. track, 25 feet northeast of road; 6 inches west of telephone pole painted "U. S. B. M. 512"; copper nail in hub, elevation 32.78 feet	29 33 18.79	95 08 03.93	4,487
Webster, 2.4 miles northwest of, 55 feet southwest of center of Galveston, Houston & Henderson R. R. track, 25 feet northeast of road; iron post stamped "Prim. Trav. Sta. No. 212, 1915", elevation 35.265 feet	29 33 53.16	95 08 36.07	4,485
Webster, 3.3 miles northwest of, 150 feet south of signpost "Olcott 1 mi.," 50 feet southwest of Galveston, Houston & Henderson R. R., 30 feet northeast of road; 6 inches west of telephone pole painted "U. S. B. M. 513"; copper nail in hub, elevation 29.10 feet	29 34 29.72	95 09 10.29	4,772
Genoa, 3.4 miles southeast of, 55 feet southwest of Galveston, Houston & Henderson R. R., 25 feet northeast of road; 6 inches southwest of telephone pole painted "U. S. B. M. 514"; copper nail in hub, elevation 29.52 feet	29 35 05.02	95 09 43.37	4,609
Genoa, 2.6 miles southeast of, opposite Olcott siding, 55 feet southwest of Galveston, Houston & Henderson R. R., 25 feet northeast of road, 20 feet northwest of steps over wire fence; iron post stamped "Prim. Trav. Sta. No. 213, 1915", elevation 34.144 feet	29 35 38.65	95 10 14.94	4,394
Genoa, 1.75 miles southeast of, 25 feet northeast of road; 6 inches south of telephone pole painted "U. S. B. M. 515"; copper nail in stub of old telephone pole, elevation 42.10 feet	29 36 13.51	95 10 47.70	4,557
Genoa, about 0.9 mile southeast of, 25 feet northeast of road; 6 inches west of telephone pole painted "U. S. B. M. 516"; copper nail in hub, elevation 41.06 feet	29 36 45.79	95 11 18.04	4,219

WEBSTER QUADRANGLE—Continued.

Along public road between Webster and Friendswood.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Webster station, Galveston-Houston Interurban R. R., near road crossing at, 10 feet northeast of center of track and 15 feet southeast of center of road; 6 inches from crossing signboard; copper nail in hub (t. b. m. 517), elevation 29.31 feet	29 31 53.18	95 07 34.68	.....
Webster, 1 mile south and 1.25 miles west of, opposite old irrigation pump house, 40 feet north of road, 4 feet from northeast corner of bridge over ditch; 6 inches from post at east end of gate, painted "U. S. B. M. 518"; copper nail in hub, elevation 23.48 feet	29 31 25.32	95 08 14.59	4,511
Webster, 1 mile south and 2.5 miles west of, 700 feet southwest of crossroads, 25 feet southeast of center of road, near fence corner; iron post stamped "Prim. Trav. Sta. No. 214, 1915", elevation 28.648 feet	29 31 26.62	95 09 31.07	6,757
Webster, 0.6 miles south and 2.8 miles west of; crossroads; shell road north, east, and southwest	29 31 49.73	95 09 47.54	2,751
Webster, 1 mile south and 3.15 miles west of, 50 feet south of right angle in road; 6 inches north of telephone pole painted "U. S. B. M. 521"; copper nail in hub, elevation 27.38 feet	29 31 30.40	95 10 08.15	2,670
Webster, 0.8 mile south and 4 miles west of, 35 feet northwest of road; 6 inches east of telephone pole painted "U. S. B. M. 522"; copper nail in hub, elevation 30.35 feet	29 31 37.00	95 10 55.45	4,231
Webster, 1 mile south and 4.2 miles west of, 300 feet northeast of east end of bridge across Clear Creek, 50 feet northwest of road, 10 feet inside fence line at edge of woods; iron post stamped "Prim. Trav. Sta. No. 215, 1915", elevat]on 18.115 feet	29 31 26.29	95 11 09.80	1,667

From Friendswood northwest on Pearland road.

Friendswood, about 70 feet south of crossroads, concrete post, 5 feet high at corner of fence around Friendswood Academy; painted "U. S. B. M. 523"; chiseled square on top of post, elevation 37.50 feet	29 31 41.26	95 11 59.65	4,655
Friendswood, 0.9 mile northwest of, 100 feet northwest of entrance to farmyard, 25 feet northeast of center of road; 6 inches west of telephone pole painted "U. S. B. M. 524"; copper nail in hub, elevation 32.24 feet	29 32 13.62	95 12 38.69	4,752
Friendswood, 2.35 miles northwest of, 30 feet south of crossroads, 3 feet north of corner fence post; iron post stamped "Prim. Trav. Sta. No. 216, 1915," elevation 41.855 feet	29 32 49.61	95 13 54.71	7,635
Friendswood, 1.35 miles north and 2.7 miles west of, just north of Marys Bayou, 60 feet southwest of road, oak tree painted "U. S. B. M. 525"; copper nail in root, elevation 43.41 feet	29 32 51.79	95 14 40.13	4,017

Near Genoa and Webster.

Genoa, 1.75 miles southeast of, top of vertical section rail; chiseled cross (C. & G. S. B. M. M. 16), elevation, 43.573 feet	.....	.....	.....
Webster, 1 mile northwest of, 18 telegraph poles northwest of mile board 21, 115 feet northeast of Galveston, Houston & Henderson Ry. tracks, 50 feet southwest of an artesian well, on land owned by Harvey T. D. Wilson, set in clay; on 3-inch red metal cap on iron pipe (C. & G. S. b. m. T8), elevation, 31.506 feet	.....	.....	.....
Webster, 1 mile south by 3.15 miles west of, 50 feet south of right angle in road, 6 inches north of telephone pole; copper nail in hub painted "U. S. 27.4 B. M. 521," elevation, 27.38 feet	.....	.....	.....
Genoa, about 3.5 miles southwest of, at south edge of prairie, 800 feet north of edge of timber, on fence line, 18 inches southwest of fence post; wire nail in hub painted "U. S. 33.9 B. M.," elevation, 33.90 feet	.....	.....	.....

WASHINGTON.

TRIANGULATION STATIONS.

Blalock Island, Pasco, and Prosser quadrangles.

BENTON, FRANKLIN, AND KLICKITAT COUNTIES.

During the season of 1906 C. F. Urquhart and A. I. Oliver extended triangulation over the above-named quadrangles. Positions were originally computed on Spokane datum (see Bulletin 440), but a correction of 3.1″ has been added to all latitudes and 7.6″ subtracted from all longitudes to reduce them to approximate North American datum.

ALDER, KLICKITAT COUNTY, WASH.

Station is on highest point of ridge just north of Columbia River and about 1 mile west from Alder Creek. It can be reached by road from Mr. Warner's ranch. The road crosses ridge about 0.25 mile west from station. Point is 2 miles from Warner's ranch and 6 miles from Castle Rock post office, at which point there is a ferry across Columbia River.

Signal: A quadripod supporting two targets of black cloth at right angles to each other.

Station mark: An aluminum tablet set in solid rock under center of signal. There is a cairn 4 feet in diameter and 2-5 feet high over tablet.

[Latitude 45° 51′ 00.89″. Longitude 119° 56′ 21.48″.]

To station—	Azimuth.	Back azimuth.	Distance.
	° ′ ″	° ′ ″	*Log. meters.*
Mule	128 49 59.95	308 34 30.47	4.5525585
Horse	189 22 28.19	9 25 36.30	4.5371674
Bender	213 13 26.58	33 29 41.38	4.7237848
Irrigon	246 07 19.92	66 23 47.98	4.5104470
Granite	292 42 51.96	113 02 01.61	4.5752815
Gleason	315 22 37.42	135 44 26.02	4.7524983
Ione	346 55 06.35	166 40 37.53	4.6370650

BENDER, BENTON COUNTY, WASH.

On high point of ridge in Horseheaven country overlooking Yakima River, about 10 miles east of Prosser. The third grade east from Prosser goes within 2 miles (southwest) of station.

Signal: A quadripod supporting two black targets at right angles to each other.

Station mark: An aluminum tablet, triangulation, set in 15 by 15 by 24 inch rock is sunk flush with surface of ground under center of signal.

[Latitude 46° 14′ 53.01″. Longitude 119° 33′ 47.48″.]

To station—	Azimuth.	Back azimuth.	Distance.
	° ′ ″	° ′ ″	*Log. meters.*
Alder	33 29 41.38	213 13 26.58	4.7237848
Horse	66 30 47.25	246 17 38.68	4.4075870
Hembree	96 01 15.58	275 29 30.34	4.7538837
Outlook	122 29 32.05	302 06 23.72	4.6858587
Rattlesnake	136 26 06.17	316 14 07.90	4.4877800
Hartman	173 02 34.88	353 01 28.80	4.2073143
White Bluff	235 09 00.07	55 22 25.60	4.4623299
Erie	274 39 07.61	94 49 45.02	4.2781434
Jumpoff Joe	295 18 13.39	115 37 01.18	4.5698130
Horseheaven	313 28 41.54	133 38 28.34	4.3816136
Irrigon	359 08 35.07	179 08 50.68	4.4938760

HARTMAN, BENTON COUNTY, WASH.

Station is on southeast end of Rattlesnake range of hills and was established by the Reclamation Service. It is not on the highest point of mountain but about 300 yards southeast from highest point. It is about 18 miles from Prosser and 15 from Kiowa. The nearest ranch is owned by Mrs. Houskins. Buckboard can be driven to station from this ranch.

Signal: A rock cairn about 4½ feet high with a small lumber structure over it.

Station mark: A hub.

[Latitude 46° 23′ 31.17″. Longitude 119° 35′ 18.85″.]

To station—	Azimuth.	Back azimuth.	Distance.
	° ′ ″	° ′ ″	*Log. meters.*
Horse	39 21 27.44	219 09 23.95	4.5299005
Rattlesnake	108 03 26.79	287 52 33.85	4.3061107
White Bluff	268 42 52.34	88 57 24.99	4.4108398
Erie	310 01 59.39	130 13 43.64	4.4354534
Horseheaven	329 10 05.89	149 20 59.40	4.5788612
Bender	353 01 28.80	173 02 34.88	4.2073143

HORSE, BENTON COUNTY, WASH.

On high point of ridge about 6 miles west from Prosser. Grade goes up ridge from Yakima River about 2 miles east from signal and turns west, running within 1 mile of signal.

Signal: A quadripod with two targets at right angles with black cloth on them.

Station mark: An aluminum tablet set in small rock flush with surface of ground, and under a cairn of rocks 3½ feet high and 4 feet in diameter.

[Latitude 46° 09′ 21.63″. Longitude 119° 51′ 59.99″.]

To station—	Azimuth.	Back azimuth.	Distance.
	° ′ ″	° ′ ″	*Log. meters.*
Alder	9 25 36.30	189 22 28.19	4.5371674
Mule	70 53 43.10	250 35 02.81	4.5486626
Hembree	115 51 13.46	295 32 38.59	4.5648934
Snipes	135 24 29.24	315 14 51.07	4.3874012
Outlook	154 02 29.46	333 52 32.31	4.6046605
Rattlesnake	183 45 13.13	3 46 25.30	4.5124619
Hartman	219 09 23.95	39 21 27.44	4.5299005
Prosser	229 42 04.40	49 46 18.59	3.9956699
Bender	246 17 38.68	66 30 47.25	4.4075870
Horseheaven	278 38 38.47	99 01 32.41	4.6171032
Irrigon	311 03 32.91	131 16 55.23	4.5026412

HORSEHEAVEN, BENTON COUNTY, WASH.

On a high, flat ridge in the Horseheaven country about 16 miles southwest from Kennewick, and about 8 or 10 miles east from Horseheaven post office. To reach point from Kennewick, go up railroad to Relief, thence by road southwest to highest point of ridge.

Signal: A lumber quadripod with black and white targets.

Station mark: A triangulation tablet set in rock under center of signal.

[Latitude 46° 05′ 55.63″. Longitude 119° 20′ 14.10″.]

To station—	Azimuth.	Back azimuth.	Distance.
	° ′ ″	° ′ ″	*Log. meters.*
Irrigon	49 29 48.96	229 20 19.13	4.3506138
Horse	99 01 32.41	278 38 38.47	4.6171032
Bender	133 38 28.34	313 28 41.54	4,3816136
Hartman	149 20 59.40	329 10 05.89	4.5788612
Erie	185 38 00.34	5 38 50.23	4.1788960
Jumpoff Joe	267 41 42.16	87 50 42.45	4.2073033

JUMPOFF JOE, BENTON COUNTY, WASH.

On highest point of a well-known ridge called "Jumpoff Joe." It is about 7 or 8 miles south of Kennewick, and can be seen from the town. There is a good road from Kennewick to summit of ridge, and buckboard can be driven from there to signal.

Signal: A lumber quadripod with black and white cloth on it.

Station mark: A triangulation tablet set in rock placed under center of signal.

[Latitude 46° 06′ 15.94″. Longitude 119° 07′ 44.28″.]

To station—	Azimuth.	Back azimuth.	Distance.
	° ′ ″	° ′ ″	*Log. meters.*
Horseheaven	87 50 42.45	267 41 42.16	4.2073033
Bender	115 37 01.18	295 18 13.39	4.5698130
Erie	134 39 46.38	314 31 35.37	4.3118793
Richland	149 11 13.88	329 04 55.00	4.3413786
White Bluff	163 32 19.83	343 26 55.19	4.5299924
Kennewick	184 57 06.88	4 57 38.92	4.0427979
Pasco	191 45 42.35	11 48 03.40	4.3122722
Pasco water tank	194 24 10.88	14 26 12.11	4.1607141
Page	218 19 01.22	38 31 50.78	4.5651622
Lerlerc	242 48 43.65	63 03 55.53	4.4836530
Wallula	292 40 46.23	112 52 11.77	4.3461720

KENNEWICK, BENTON COUNTY, WASH. (Not occupied.)

Station mark: The pole in cupola on large brick schoolhouse in town of Kennewick on Northern Pacific Railroad.

[Latitude 46° 12′ 12.02″. Longitude 119° 06′ 59.85″.]

To station—	Azimuth.	Back azimuth.	Distance.
	° ′ ″	° ′ ″	*Log. meters.*
Jumpoff Joe	4 57 38.92	184 57 06.88	4.0427979
Erie	102 25 19.27	282 16 35.77	4.2016547
Pasco	199 34 00.06	19 35 46.37	3.9847832

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MULE, KLICKITAT COUNTY, WASH.

Located on northeast top of a bald ridge about 4 miles to the north of Bickleton. Bickleton is reached by wagon road from Prosser, a distance of about 30 miles. A buckboard can be taken on to point from Bickleton side. Highest top of hill is southwest of the signal 100 yards but is not more than 2 or 3 feet higher. View to the southwest is cut out by near-by mountains but the view is good in all other directions.

Signal: A mound of rock 5 feet high and centered over this is an upright timber standing 13 feet high, which carries two sheets of white cloth 4 by 6 feet at right angles to each other.

Station mark: The rock cairn.

[Latitude 46° 03′ 03.73″. Longitude 120° 17′ 54.69″.]

To station—	Azimuth.	Back azimuth.	Distance.
	° ′ ″	° ′ ″	*Log. meters.*
Hembree	180 28 39.42	0 28 47.17	4.4407832
Outlook	198 00 19.10	18 09 05.82	4.7016233
Rattlesnake	218 35 47.03	38 55 42.18	4.7528853
Horse	250 35 02.81	70 53 43.10	4.5486626
Alder	308 34 30.47	128 49 59.95	4.5525585

OUTLOOK, BENTON COUNTY, WASH.

On a high flat-topped ridge of the Rattlesnake Mountains north from Outlook post office and near the head of Moxee Valley. It can be driven to from either the Yakima or Moxee valley. An old road crosses the ridge about 2½ miles west from signal, and from summit on road buckboard can be driven up ridge to signal.

Signal: A lumber tripod.

Station mark: A small rock cairn.

[Latitude 46° 28′ 52.56″. Longitude 120° 05′ 45.76″.]

To station—	Azimuth.	Back azimuth.	Distance.
	° ′ ″	° ′ ″	*Log. meters.*
Mule	18 09 05.82	198 00 19.10	4.7016233
Hembree	37 15 10.71	217 06 30.69	4.4047234
Satas[a]	64 04 19.1	243 35 48.9	4.7501303
Atanum	96 08 53.06	275 47 18.68	4.5827464
Moxee	144 53 48.13	324 47 37.48	4.2762391
Rattlesnake	280 28 02.25	100 39 13.21	4.3029654
Bender	302 06 23.72	122 29 32.05	4.6858587
Horse	333 52 32.31	154 02 29.46	4.6046605
Snipes	358 21 41.27	178 21 59.47	4.2743965

[a] From Ellensburg datum.

PASCO, FRANKLIN COUNTY, WASH.

Station is on a sagebrush hill 3 or 4 miles north of Pasco. To reach station go up road on east side of railroad track. There is one road which turns to the right and another to the left, but the road running practically straight passes within 100 yards of signal. Signal can be seen after getting about 1 mile from town.

Signal: A lumber quadripod with white and black cloth on it.

Station mark: A triangulation tablet set in rock, placed under center of signal.

[Latitude 46° 17′ 06.67″. Longitude 119° 04′ 28.85″.]

To station—	Azimuth.	Back azimuth.	Distance.
	° ′ ″	° ′ ″	*Log. meters.*
Pasco water tank	5 32 03.37	185 31 46.34	3.7851985
Jumpoff Joe	11 48 03.40	191 45 42.35	4.3122722
Kennewick	19 35 46.37	199 34 00.06	3.9847832
Erie	73 12 14.37	253 01 41.42	4.2924577
Page	244 52 54.95	65 03 24.32	4.3127162
Lerlere	285 08 03.64	105 20 55.70	4.3751992
Wallula	330 24 54.62	150 34 00.24	4.5179564

ERIE, BENTON COUNTY, WASH.

On a bald hill between Yakima River near its mouth and the Northern Pacific Railway. It is about 4 miles southwest from Richland and 10 or 12 miles west from Kennewick. Can drive to summit of hill.

Signal: A lumber quadripod with white and black targets.

Station mark: Triangulation tablet set in rock under center of signal.

Observer: C. F. Urquhart, 1906.

[Latitude 46° 14′ 02.22″. Longitude 119° 19′ 04.94″.]

To station—	Azimuth.	Back azimuth.	Distance.
	° ′ ″	° ′ ″	*Log. meters.*
Horseheaven	5 38 50.23	185 38 00.34	4.1788960
Bender	94 49 45.02	274 39 07.61	4.2781434
Hartman	130 13 43.64	310 01 59.39	4.4354534
White Bluff	195 16 22.12	15 19 09.34	4.2731138
Pasco	253 01 41.42	73 12 14.37	4.2924577
Pasco water tank	271 05 44.67	91 15 57.56	4.2598434
Richland	216 52 14.92	36 54 07.34	3.7445776
Kennewick	282 16 35.77	102 25 19.27	4.2016547
Jumpoff Joe	314 31 35.37	134 39 46.38	4.3118793

PASCO WATER TANK, FRANKLIN COUNTY, WASH. (Not occupied.)

Station mark: Northern Pacific Railway water tank in town of Pasco.

[Latitude 46° 13′ 50.08″. Longitude 119° 04′ 56.22″.]

To station—	Azimuth.	Back azimuth.	Distance.
	° ′ ″	° ′ ″	*Log. meters.*
Jumpoff Joe	14 26 12.11	194 24 10.88	4.1607141
Erie	91 15 57.56	271 05 44.67	4.2598434
Pasco	185 31 46.34	5 32 03.37	3.7851985

PROSSER, BENTON COUNTY, WASH. (Not occupied.)

Station mark: Center of smokestack on power plant near lower bridge on Yakima River at Prosser.

[Latitude 46° 12′ 48.86″. Longitude 119° 46′ 08.76″.]

To station—	Azimuth.	Back azimuth.	Distance.
	° ′ ″	° ′ ″	*Log. meters.*
Horse	49 46 18.59	229 42 04.40	3.9956699
Rattlesnake	168 19 29.01	348 16 26.40	4.4253306

RATTLESNAKE, BENTON COUNTY, WASH.

Station is on the highest point near center of Rattlesnake range, about 20 miles north-northwest from Prosser. Take the Rattlesnake road to Mr. Dyke's ranch, thence by road north to summit of ridge, thence west along ridge to signal. One high point is passed before signal is reached.

Signal: A small cairn with lumber tripod built over it.

Station mark: A triangulation tablet set in rock, 20 inches in diameter, placed under center of cairn.

[Latitude 46° 26′ 53.32″. Longitude 119° 50′ 20.21″.]

To station—	Azimuth.	Back azimuth.	Distance.
	° ′ ″	° ′ ″	*Log. meters.*
Horse	3 46 25.30	183 45 13.13	4.5124619
Mule	38 55 42.18	218 35 47.03	4.7528852
Snipes	51 55 48.39	231 44 56.56	4.3886805
Hembree	64 56 29.51	244 36 39.68	4.5892302
Outlook	100 39 13.21	280 28 02.25	4.3029654
Moxee	122 08 55.47	301 51 33.19	4.5573767
Coal	169 06 23.35	349 04 25.80	4.2610327
Hartman	287 52 33.85	108 03 26.79	4.3061107
Bender	316 14 07.90	136 26 06.17	4.4877800
Prosser power plant	348 16 26.40	168 19 29.01	4.4253306

SNIPES, BENTON COUNTY, WASH. (Not occupied.)

On well-known and prominent hill 2 or 3 miles west of Sunnyside.

Station mark: A cairn about 5 feet high on summit of hill.

[Latitude 46° 18′ 43.62″. Longitude 120° 05′ 20.62″.]

To station—	Azimuth.	Back azimuth.	Distance.
	° ′ ″	° ′ ″	*Log. meters.*
Hembree	84 56 26.38	264 47 28.91	4.2033539
Outlook	178 21 59.47	358 21 41.27	4.2743965
Rattlesnake	231 44 56.56	51 55 48.39	4.3886805
Horse	315 14 51.07	135 24 29.22	4.3874012

WHITE BLUFF, FRANKLIN COUNTY, WASH.

On the north side of and overlooking Columbia River about 16 miles above Pasco. It is first of the white bluffs going up the river. The road known as the river road from Pasco passes within 100 yards of the signal. This road goes to river about 4.5 miles from Pasco, thence up river to Richland Ferry, thence through sagebrush to river again at foot of bluff, thence up hill to signal.

Signal: A lumber quadripod with white and black cloth on it.

Station mark: A triangulation tablet set in rock placed under center of signal.

[Latitude 46° 23′ 48.11″. Longitude 119° 15′ 13.70″.]

To station—	Azimuth.	Back azimuth.	Distance.
	° ′ ″	° ′ ″	*Log. meters.*
Erie	15 19 09.34	195 16 22.12	4.2731138
Bender	55 22 25.60	235 09 00.07	4.4623299
Hartman	88 57 24.99	268 42 52.34	4.4108398
Page	276 22 16.19	96 40 32.98	4.5130690
Lerlerc	296 45 59.58	117 06 38.67	4.6141305
Jumpoff Joe	343 26 55.19	163 32 19.83	4.5299924

PRIMARY TRAVERSE.

Cape Elizabeth (30′), Hoquiam (15′), Humptulips (30′), and Ocosta (15′) quadrangles.

CHEHALIS COUNTY.

The following geographic positions on North American datum were determined by primary traverse and are based upon Coast and Geodetic Survey triangulation stations Chehalis, Drummond, Flat, Langley, Lone Tree, and Tank. The work was done by L. F. Biggs in 1913.

CAPE ELIZABETH QUADRANGLE.

Along highways in southeast quarter of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Small bridge at logging camp, west end of, 375 feet southeast of log chute	47 03 20.8	124 00 00.7	.....
Two bridges, center of one farthest east	47 03 57.2	124 00 47.5	4,903
Small bridge, center of	47 04 00.9	124 01 17.1	2,082
Blazed tree, south edge of road on section line	47 04 05.7	124 01 31.1	1,089
Small pump, south of road	47 04 22.9	124 02 17.2	3,638
Bridge, 210 feet west to T road south	47 04 20.8	124 02 33.4	1,139
Tulips, center of Northern Pacific Ry. track at road crossing	47 04 20.7	124 02 55.8	1,555
Tps. 18 and 19 N., R. 11 W., corner secs. 3, 4, 33, and 34, 1,970 feet west of L in road	47 05 07.1	124 02 45.5	4,750
T road south, 100 feet east of track at crossing	47 05 35.1	124 03 35.6	4,486
Newtown post office, 1 mile northwest of, in southeast pier of bridge over Humptulips River; aluminum tablet stamped "Prim. Trav. Sta. No. 8, elevation 37 feet 1911"	47 05 49.8	124 03 29.6	1,549
Section X at camp (blaze not found, but fence supposed to be line)	47 06 02.1	124 03 38.8	1,396
T road northeast, signboard reads: Copalis, 5.5 miles; Moclips, 14.5 miles; Hoquiam, 15.4 miles	47 06 30.3	124 04 06.0	3,419
Copalis, Northern Pacific Ry. crossing	47 06 46.8	124 04 42.1	3,008
Center of track at logging road	47 06 57.5	124 05 05.3	1,935
Notched tree, apparently section crossing	47 06 58.3	124 05 53.8	3,359
Langley triangulation station, Coast and Geodetic Survey	47 07 00.26	124 06 46.45	3,647
L road south, at south end of long tangent	47 07 07.8	124 09 05.9	9,674
Copalis schoolhouse, 0.80 mile east of corner sections	47 06 54.9	124 09 06.1	1,310
Copalis schoolhouse, 20 feet northwest of; iron post stamped "Prim. Trav Sta. No. 9, 1911; elev. 24 feet, Wash."	47 06 55.0	124 10 05.6	4,117
Small stream crossing	47 06 27.8	124 10 38.4	3,577
Fisherman's tower	47 05 58.6	124 10 27.0	3,071
Small stream crossing	47 05 21.7	124 10 24.0	3,752
Stack on mill	47 05 20.5	124 10 13.4	743
Mouth of creek, on north side, at high-water mark	47 04 42.2	124 10 07.5	3,900
Fisherman's tower	47 03 35.0	124 10 01.2	6,829
Mail box	47 03 01.7	124 09 58.4	3,382
Mail rack, U. S. G. S. No. 1	47 02 39.2	124 09 57.0	2,291
Mail rack, U. S. G. S. No. 2	47 01 25.4	124 09 46.1	7,510
Oyhut road, mail rack at	47 01 03.3	124 09 45.2	2,250
Iron bench-mark post "Prim. Trav. Sta. No. 10"	47 01 04.2	124 09 23.8	1,483

Along Northern Pacific Railway in southeast quarter of quadrangle.

Road crossing, center of track	47 04 03.8	124 02 36.5	.....
Do	47 03 54.3	124 02 25.6	1,226
Center of bridge	47 03 45.0	124 02 15.2	1,189
Primary traverse station No. 11, elevation 17 feet	47 03 26.0	124 02 10.8	1,943
Northern Pacific Ry., west end of tangent	47 02 41.5	124 02 11.7	4,510
Center of bridge	47 01 52.2	124 01 28.8	5,812
Chenois Creek station, center of track at	47 01 50.2	124 01 27.1	240
Gray Gables, road crossing 270 feet northwest of station	47 00 52.2	124 00 32.9	6,976
Prim. Trav. Sta. No. 12, elevation 6 feet; iron post	47 00 19.6	124 00 07.7	3,731
Center of bridge	47 00 14.7	124 00 09.2	506

Magnetic declination in southeast quarter of quadrangle, 23° 50′ E.

OCOSTA QUADRANGLE.

Along highways in northwestern part of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Box signal	46 59 37.1	124 09 28.9	
United States engineering department signal	46 58 14.0	124 09 37.6	8,444
Lone Tree triangulation station, Coast and Geodetic Survey	46 57 07.68	124 07 35.78	10,795

Magnetic declination near north border of quadrangle, 23° 40′ E.

HOQUIAM QUADRANGLE.

Along highways in northeastern part of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
Tank triangulation station (Coast and Geodetic Survey) on southwest side of platform of water tank in southwest part of Aberdeen; station mark an iron pipe 1½ inches diameter, 9 feet long, driven 8 feet in ground	° ′ ″ 46 58 00.71	° ′ ″ 123 49 45.49	*Feet.*
Aberdeen, city hall, west side of main entrance, in top of corner stone; aluminum tablet stamped "Prim. Trav. Sta. No. 1, Wash., 1911"	46 58 35.0	123 48 59.7	4,707
Aberdeen, 0.90 mile northwest of, T road	46 59 22.1	123 48 47.4	4,850
Aberdeen, 1.25 miles northwest of, at north end of bridge, center of Y road	46 59 38.3	123 48 43.1	1,662
Aberdeen, 1.65 miles northwest of, U. S. t. b. m., elevation 21 feet	46 59 54.3	123 48 25.5	2,033

Along highways near Flat triangulation station.

Flat triangulation station, Coast and Geodetic Survey, on north shore of Grays Harbor, about 0.5 mile west of Hoquiam. It is 27.9 meters south of Northern Pacific Ry. track. 25 meters from and 2 feet above high-water mark. Station mark a copper tack in top of a spruce hub, 12 by 6 by 22 inches	46 58 45.22	123 54 13.50	
Hoquiam, intersection of Emerson and Lincoln streets	46 58 53.0	123 53 05.2	4,803
Hoquiam, 0.80 mile north of, T road west	46 59 35.7	123 53 05.2	4,320
Hoquiam, 1.30 miles northwest of, at mouth of Little Hoquaim River, at west end of bridge, 15 feet south of road; iron post stamped "Prim. Trav. Sta. No. 6, elevation 16, Wash., 1911"	46 59 42.6	123 53 40.3	2,539

Along Northern Pacific Railway in northwest quarter of quadrangle.

United States bench mark, elevation 13 feet, also primary traverse station No. 13	46 58 57.7	123 58 36.3	10,120
Grays Harbor city station	46 58 58.3	123 57 27.8	4,752
Grays Harbor city station, 0.40 mile southeast of, water column	46 59 01.6	123 56 58.2	2,085
Grays Harbor city station, 1.90 miles southeast of; iron post stamped "Prim. Trav. Sta. No. 14, elevation 10 feet"	46 58 56.3	123 55 05.5	7,831

Along highways in northeast quarter of quadrangle.

Drummond triangulation station, Coast and Geodetic Survey	46 57 04.26	123 51 10.98	
Railroad bridge, center of	46 57 02.3	123 51 02.3	632
Drummond triangulation station, 0.60 mile southeast of, cross-roads	46 56 38.0	123 50 48.3	2,647
Drummond triangulation station, 0.85 mile southeast of, center of bridge	46 56 26.3	123 50 40.6	1,304
Drummond triangulation station, 1.20 miles southeast of, hub at bridge	46 56 07.9	123 50 33.1	1,931
Drummond triangulation station, 1.90 miles southeast of, U. S. b. m. elevation 24 feet	46 55 53.4	123 50 24.0	1,600
Newskak schoolhouse, 1.60 miles northwest of, bridge over small stream	46 55 23.4	123 49 32.0	4,717
Newskak schoolhouse, 1.50 miles northwest of, t. b. m. elevation 51 feet	46 55 20.0	123 49 29.0	400

HOQUIAM QUADRANGLE—Continued.

Along highways in northeast quarter of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Newskak schoolhouse, 1.10 miles northwest of, U. S. t. b. m. elevation 55 feet	46 54 59.0	123 49 19.5	2,236
Newskak schoolhouse, 0.60 mile northwest of, center of bridge	46 54 54.5	123 49 20.0	452
Newskak schoolhouse, 0.14 mile northwest of, southwest corner sec. 33	46 54 31.1	123 49 12.7	2,422
Newskak schoolhouse	46 54 30.7	123 49 01.6	769
Along highways between Drummond and Chehalis triangulation stations.			
T. 17 N., R. 9 W., corner secs. 16, 17, 20, and 21, 0.90 mile southwest of	46 56 53.5	123 50 15.9	.....
T. 17 N., R. 9 W., corner secs. 16, 17, 20, and 21	46 57 07.9	123 49 10.3	4,782
T. 17 N., R. 9 W., corner secs. 16, 17, 20, and 21, about 0.40 mile north of, at angle in wagon road, center of Northern Pacific R. R. track	46 57 27.3	123 49 10.4	1,960
Chehalis triangulation station, Coast and Geodetic Survey, south side of Grays Harbor at mouth of Chehalis River, just west of South Aberdeen; station mark, iron pipe, 2½ inches in diameter, 9 feet long, set 7 feet in ground	46 57 33.52	123 49 10.58	630

Magnetic declination near north border of quadrangle, 24° 10′ E.

HUMPTULIPS QUADRANGLE.

Along highways in southwest quarter of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Aberdeen, 3.35 miles northeast of, 45 feet northeast of district schoolhouse No. 10, on west side of road; iron post stamped "Prim. Trav. Sta. No. 2, 1911–13 Wash."	47 00 35.9	123 48 44.2	.....
Aberdeen, 4.40 miles northeast of, center of road in front of house	47 01 31.0	123 48 54.0	5,626
District schoolhouse No. 10, 1.25 miles northeast of, small bridge over creek	47 01 40.5	123 48 49.7	1,004
District schoolhouse No. 10, 2.65 miles northeast of, 200 feet north of road to A. F. Coates Logging Co., 15 feet west of road; iron bench mark post stamped "Prim. Trav. Sta. No. 3, 24, 1911, Wash."	47 02 29.3	123 47 33.0	7,263
District schoolhouse No. 10, 2.90 miles northeast of, center of bridge	47 02 41.0	123 47 31.3	1,190
District schoolhouse No. 10, 3.30 miles northeast of, T road east	47 03 01.9	123 47 24.8	2,163
District schoolhouse No. 10, 3.80 miles northeast of, T road east	47 03 20.5	123 47 02.4	2,437
District schoolhouse No. 10, 4.60 miles northeast of, T. 18 N., R. 9 W., corner secs. 2, 3, 10, and 11	47 04 00.2	123 46 37.5	4,375
Wishkah, in top of southwest pier of steel bridge over Wishkah River; aluminum tablet stamped "Prim. Trav. Sta. No. 4, Wash. 26, 1911"	47 04 20.8	123 46 10.9	2,783
T. 19 N., R. 9 W., ¼ corner south side sec. 35, T road north	47 04 51.7	123 45 53.6	3,356
Schoolhouse No. 34, 650 feet north of, angle to west in road	47 05 36.8	123 45 53.2	4,569
Schoolhouse No. 34, 0.50 mile northwest of, south end of bridge	47 05 54.4	123 46 11.4	2,175
T. 19 N., R. 9 W., ¼ corner west side sec. 26	47 06 09.1	123 46 31.4	2,037
T. 19 N., R. 9 W., corner secs. 22, 23, 26, and 27	47 06 35.3	123 46 30.9	2,646
T. 19 N., R. 9 W., ¼ corner north side of sec. 27, 50 feet southwest of Matson house (corner not positively identified)	47 06 35.4	123 47 10.4	2,727
Matson house, 0.60 mile northwest of, saddle center of road	47 06 56.9	123 47 40.5	3,013
Harry Lloyd's house, 100 feet west of, 350 feet north of footbridge over river, 8 feet west of T road east; iron gas pipe 4 feet by 1½ inches, driven 3½ feet into ground	47 07 04.1	123 48 26.1	3,242
T. 19 N., R. 9 W., 10 feet west of Polson logging railroad, at junction of old grade to northwest, near center of sec. 19; iron post stamped "Prim. Trav. Sta. No. 6"	47 06 58.8	123 50 41.4	9,370
Prim. Trav. Sta. No. 6, 1.50 miles northwest of, west end of long tangent at farthest point north of old railroad grade, center of cut	47 07 31.5	123 52 26.6	7,991
Prim. Trav. Sta. No. 6, 3 miles west of, center of bridge over creek	47 06 35.8	123 53 45.1	7,829
Prim. Trav. Stat. No. 6, 4.25 miles southwest of, U. S. b. m. stamped "Prim. Trav. Sta. No. 16, elevation 307 ft."	47 05 59.8	123 55 05.3	6,640
Barnesville, 3.80 miles northeast of, Y road	47 04 58.7	123 55 08.8	6,196
Barnesville, 280 miles northeast of, iron bench mark post stamped "Prim. Trav. Sta. No. 15, elevation 42 feet"	47 04 12.3	123 55 42.2	5,243
Barnesville, 2.60 miles northeast of, T. 18 N., R. 10 W., ¼ corner south side sec. 4, center of stream	47 04 05.7	123 55 53.5	1,030
Barnesville, 1.35 miles northeast of, center of bridge over river	47 03 04.3	123 55 27.5	6,171
Barnesville, 0.70 mile northeast of, center of bridge	47 02 30.8	123 55 20.9	3,424

Along highways in southwest corner of southwest quarter of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Temporary bench mark at L in road, elevation 7 feet	47 00 24.9	123 54 21.9	
Center of small bridge	47 00 56.3	123 54 48.0	3,667
Hoquiam, about 5 miles north of, south of junction of Humptulips-Moolips road, in top of southeast pier of bridge; aluminum tablet stamped "Prim. Trav. Sta. No. 7, elev. 10, Wash., 1911"	47 01 52.2	123 55 17.4	6,021
District schoolhouse No. 71, center of road in front of	47 02 01.8	123 55 31.4	1,378
District schoolhouse No. 71, 0.54 mile northwest of, center of small bridge over creek	47 02 13.2	123 56 08.6	2,822
T. 18 N., R. 10 W., corner secs. 16, 17, 20, and 21	47 02 19.6	123 56 32.6	1,788
T. 18 N., R. 10 W., corner secs. 16, 17, 20, and 21, 0.32 mile northwest of, center of small bridge over creek	47 02 26.8	123 56 54.7	1,690
T. 18 N., R. 10 W., corner secs. 16, 17, 20, and 21, 1.10 miles northwest of, center of road at Y road west	47 02 38.9	123 57 51.2	4,101
T. 18 N., R. 10 W., corner secs. 16, 17, 20, and 21, 1.35 miles northwest of, center of T road east	47 02 51.6	123 57 54.5	1,309
T. 18 N., R. 10 W., corner secs. 16, 17, 20, and 21, 2.55 miles northwest of, center of bridge at old south road	47 03 13.3	123 59 18.5	6,216
T. 18 N., R. 10 W., corner secs. 16, 17, 20, and 21, 2.90 miles northwest of, center of small bridge over creek	47 03 18.7	123 59 43.8	1,840
T. 18 N., R. 10 W., corner secs. 16, 17, 20, and 21, 3 miles northwest of, center of bridge over creek	47 03 19.2	123 59 52.1	579

Magnetic declination near east border of southwest quarter of quadrangle, 23° 47′ E.; near west border, 24° 34′ E.

VIRGINIA AND WEST VIRGINIA.

PRIMARY TRAVERSE.

Berryville, Gerrardstown, Martinsburg, Stephens City, and Williamsport quadrangles.

CLARKE AND FREDERICK COUNTIES, VA.; BERKELEY AND JEFFERSON, COUNTIES, W. VA.

The following geographic positions on North American datum were determined from primary traverse by G. T. Hawkins in 1914. Several circuits were run in the above-mentioned quadrangles, all being based on Birch triangulation station, described in the Twentieth Annual Report, part 1.

BERRYVILLE QUADRANGLE.

From Summit Point along highways via Castlemans Ferry and Snickers Gap to southeast corner of West Virginia.

Station.	Latitude.	Longitude.	Distance between stations.
WEST VIRGINIA.	° ′ ″	° ′ ″	*Feet.*
Summit Point, crossing north of station	39 15 04.6	77 57 22.3	.....
Summit Point, four corners, 1½ miles south of	39 13 27.5	77 57 22.7	9,818
T road south, 30 feet southeast to two mail boxes	39 13 14.1	77 55 54.2	7,100
Ripon station, road crossing Norfolk Southern Ry. at	39 13 09.8	77 54 55.5	4,639
Ripon Village, four corners at	39 13 06.4	77 54 18.0	2,966
Four corners, at small creek, 40 feet south to two mail boxes	39 11 47.0	77 53 46.8	8,398
Wickliff, ¾ mile north of, in triangle formed by three roads 30 feet southwest of large pile of stone, and 30 feet south of gate; tablet in stone in place and stamped "Prim. Trav. Sta. No. 7, 1914"	39 10 35.9	77 53 25.4	7,384
State line crossing wagon road	39 10 26.7	77 53 31.5	1,040
VIRGINIA (CHECKED SPUR LINE).			
Wickliff, three corners ½ mile west of	39 09 50.0	77 53 50.6	4,012
Battle monument marked Early and Crook, July 18, 1864, at elbow in road	39 09 01.7	77 53 24.8	5,293
Castleman Ferry bridge, west end of truss work	39 07 27.4	77 53 32.1	9,556
Church, road leading south from pike at	39 07 01.6	77 51 34.8	9,606
Snickers Gap, four corners at	39 06 55.3	77 50 44.7	3,996
Flag pole on top of F. G. Carpenter's house	39 07 41.4	77 50 49.2	4,670
Southeast corner of West Virginia, drilled cross in top of stone	39 07 56.2	77 49 41.7	5,524

From bench mark No. 7 northeast to Mechanicsburg.

WEST VIRGINIA.			
B. m. No. 7, 1914	39 10 35.9	77 53 25.4	.....
Three corners, roads east, west, and south, 20 feet east to stone	39 10 37.6	77 52 52.1	2,630
T road west, 500 feet west to windmill	39 11 32.4	77 52 19.1	6,125
Four corners, 20 feet southwest to battle monument No. 15	39 12 21.2	77 51 48.0	5,515
Kabletown, T road south, north of, 100 feet northwest to church, 200 feet southeast to schoolhouse	39 13 16.7	77 51 34.1	5,732
T road southeast, 150 feet northwest to house	39 14 03.6	77 51 06.8	5,203

From bench mark No. 10 east to Summit Point.

B. m. No. 10, 1914	39 14 34.2	78 00 28.0	.....
Milepost 19, on valley branch of Baltimore & Ohio R. R., road crossing near	39 14 45.1	77 58 39.8	8,580
Summit Point, station crossing north of	39 15 04.6	77 57 22.3	6,404

Magnetic declination 5° 08′ W.

GERRARDSTOWN QUADRANGLE.

Along highways.

Station.	Latitude.	Longitude.	Distance between stations.
WEST VIRGINIA.			
	° ′ ″	° ′ ″	*Feet.*
Birch triangulation station, about 8 miles southwest from Martinsburg, on the highest point of a ridge; signal tree	39 25 12.0	78 05 21.4	.....
Fairview schoolhouse, T road north at	39 19 34.5	78 00 33.6	.....
Big frame house, T road north in front of	39 19 38.6	78 01 22.6	3,870
Three corners, 90 feet south to small white house	39 20 27.4	78 01 06.3	5,100

Along Cumberland Valley Railroad.

Inwood, ¼ mile east of, on north side east and west road and on west side of pipe, in solid rock 30 feet northwest of old house; tablet stamped "Prim. Trav. Sta. No. 6, 1914"	39 21 27.9	78 02 23.9	8,640
Inwood, road crossing Cumberland Valley R. R. at	39 21 31.4	78 02 39.7	1,290
Darkesville station, railroad crossing at	39 22 23.8	78 01 55.2	6,361
Darkesville station, railroad crossing 1½ miles north of	39 23 20.7	78 01 07.2	6,890
Tabler station, railroad crossing at	39 23 55.2	78 00 38.1	4,171
Tabler station, crossing at	39 23 55.2	78 00 38.1	[a] 23,550
Tabler station, crossing ¾ mile northeast of	39 24 29.1	78 00 09.4	4,100

[a] Distance to Birch triangulation station.

From Inwood west and south along highways through Whitehall and Clearbrook to Brucetown.

WEST VIRGINIA.			
Inwood, road crossing Cumberland Valley Ry. at	39 21 31.4	78 02 39.7	.....
Second class T road north	39 21 40.7	78 03 52.2	5,770
Four corners, 150 feet south to creek crossing north and south road	39 21 57.1	78 04 42.2	4,272
Three corners, 20 feet west to signpost	39 21 02.9	78 05 05.8	5,786
T road west, 20 feet east to telephone post	39 20 17.0	78 05 43.8	5,515
T road west, also State line (?); 100 feet west to 4-foot oak	39 19 30.9	78 07 10.6	8,264
VIRGINIA.			
Three corners, 40 feet south to two mail boxes	39 19 01.0	78 07 52.7	4,481
T road northwest, 20 feet northwest to mail box	39 18 17.1	78 08 25.9	5,153
Whitehall four corners, 40 feet southwest to store	39 17 29.5	78 08 55.4	5,346
T road northwest, 50 feet southeast to house, 60 feet southwest to mail box	39 16 30.2	78 09 44.2	7,121
Whitehall, 2½ miles southwest of; near four corners, on north side of east and west road and 120 feet from four corners, in solid ledge, tablet stamped "Prim. Trav. Sta. No. 9, 1914"	39 15 35.4	78 10 00.5	5,688
Wellstown, T road east, ½ mile north of, 300 feet north to house	39 15 34.9	78 08 00.4	9,445
Clearbrook station, highway crossing Cumberland Valley R. R., 300 feet southwest of	39 15 22.2	78 05 50.6	10,280
Brucetown, three corners at west end of; 30 feet northeast to iron fence	39 15 16.7	78 04 01.6	8,588

Magnetic declination, 5° 17′ W.

MARTINSBURG QUADRANGLE.

Along Cumberland Valley Railroad.

Station.	Latitude.	Longitude.	Distance between stations.
WEST VIRGINIA.			
	° ′ ″	° ′ ″	*Feet.*
Milepost 96, railway opposite	39 25 50.7	77 59 31.6	.....
Milepost 95, railway crossing 260 feet south of	39 26 37.7	77 59 12.2	5,000
Martinsburg, railway crossing at	39 27 27.2	77 58 17.2	6,608
Martinsburg, crossing of Cumberland Valley and Baltimore & Ohio R. Rs.	39 28 00.1	77 57 51.3	3,900
Martinsburg, crossing of turnpike and Cumberland Valley R. R. north of	39 28 47.4	77 57 03.0	6,100
Berkeley station, crossing ¾ mile southwest of	39 29 45 7	77 56 16.7	6,931

MARTINSBURG QUADRANGLE—Continued.

Along highways.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Four corners, 30 feet southwest to old house	39 29 47.7	77 53 38.3	
Greensburg, four corners at	39 29 24.8	77 53 08.0	3,317
Second-class T road south through gate	39 29 24 2	77 51 02.2	9,865
Scrabble, T road north at post office	39 29 00.1	77 49 59.6	5,485
Scrabble, 400 feet east of on south side of road in solid rock, 61 feet from southeast corner of iron bridge, 56 feet from southwest corner of blacksmith shop, regulation tablet stamped "Prim. Trav. Sta. No. 2, 1914"	39 28 57.9	77 49 55.3	406
Maple Shade farm gate, three corners 100 feet southwest of	39 28 59.9	77 48 38.1	6,060
Second-class T lane east	39 28 11.9	77 48 37.6	4,855
Three corners, 150 feet east to house	39 27 25.9	77 48 45.8	4,700
Shepherdstown station, crossing Norfolk and Western Ry., 250 feet northeast of	39 25 49.9	77 48 04.6	10,240
Shepherdstown station, 1¼ miles southwest of, pike opposite battle monument No. 2	39 24 55.0	77 50 17.3	11,807
Second-class T road west, 30 feet southwest to end of stone fence	39 24 37.9	77 50 59.7	3,746
Crossroads, 150 feet north to large brick house	39 23 59.0	77 52 18.8	7,356
Kearneyville, in solid rock, 15 feet east of pike, 6 feet west of fence 200 feet south of main line of Baltimore & Ohio R. R.; tablet stamped "Prim. Trav. Sta. No. 8, 1914"	39 23 17.5	77 53 06.6	5,630
Kearneyville, ¾ mile southwest of, T road northwest, 100 feet north to negro's house	39 22 56.2	77 53 38.8	3,318
Three corners, transmission line runs southeast	39 22 35.4	77 54 04.1	2,900
Three corners, T road northwest, 250 feet northeast to schoolhouse	39 21 54.2	77 54 54.1	5,718
Three corners, 180 feet southeast to house	39 21 22.9	77 55 33.1	4,408
Leetown, three corners at, 40 feet east to battle monument No. 11	39 20 54.5	77 56 00.0	3,574
Leetown, three corners at, ½ mile southwest of, 30 feet north to sign posted "Keep off"	39 20 40.2	77 56 22.0	2,250
T lane northwest	39 20 00.2	77 57 03.1	5,176
T road southeast, 30 feet east to two mail boxes	39 19 30.6	77 57 32.6	3,792
T road northwest, 50 feet west to mail box	39 19 08.9	77 58 08.8	3,590
Middleway, four corners at, 30 feet northeast to house, 30 feet southwest to house, 30 feet southwest to Bunkerhill	39 18 12.5	77 58 58.9	6,931
Center of iron bridge, also county line between Berkeley and Jefferson Counties	39 18 36.9	77 59 52.2	4,861

Magnetic declination for north border of quadrangle, 5° 20′ W.; for center, 5° 14′ W.

From Shepherdstown along highways via Harpers Ferry, Charles Town, and Summit Point to adjusted position at Middleway.

Shepherdstown	39 25 49.9	77 48 04.6	
Shepherdstown, T road east, 1 mile south of	39 25 04.2	77 48 24.9	4,898
Short jog in road, north end of, 40 feet north to gate	39 24 16.7	77 46 53.1	8,660
Mohlers crossroads, 75 feet west to battle monument No. 5	39 23 45.3	77 45 54.7	5,580
Shepherdstown, 4 miles southeast of, 300 feet west of Potomac River on east side of road, and 100 feet south of small branch, in solid ledge; tablet (no stamped marks, as dies were lost)	39 22 52.9	77 45 16.0	6,114
Second-class road to east, 50 feet southeast to three mail boxes	39 21 49.4	77 44 57.2	6,590
Three-corners at transmission line	39 20 23.4	77 45 51.6	9,701
Pitchers Mill, road crossing creek at	39 20 04.5	77 45 40.1	2,117
Old toll house 2 miles west of Harpers Ferry, four corners at	39 18 59.5	77 46 18.7	7,237
Millville, road crossing Baltimore & Ohio R. R. at	39 17 36.9	77 47 10.4	9,300
Millville, 1 mile south of, on west bank of Shenandoah River, at ferry landing and at T road west, 46 feet southwest of 40-inch burr oak, in solid rock; tablet (no stamped letters, as dies were lost)	39 16 50.8	77 47 22.6	4,754
Turn in road, 40 feet south to house, 130 feet northwest to house, 30 feet west to green pump	39 15 52.3	77 47 27.9	5,942
Three-corners, 30 feet north to house, 60 feet southwest to house	39 15 17.4	77 49 08.7	8,680
Mechanicsburg, four corners	39 15 42.0	77 49 53.5	4,323
Charles Town, three corners, south of, 60 feet east to small white house	39 16 40.3	77 51 09.2	8,376
Charles Town, corner Berryville pike, Summit Point road and southwest street	39 17 15.6	77 51 49.7	4,784
Charles Town, 2 miles southwest of, on west side Summit Point Road, 2 feet east of fence and 150 feet southwest of S. P. Stickel's house, in solid rock; tablet stamped "Prim. Trav. Sta. No. 5, 1914"	39 16 26.9	77 54 33.5	13,787
Crossroads, 30 feet north to mail box	39 15 49.5	77 55 26.6	5,640
Summit Point station, road crossing Baltimore & Ohio R. R., 1,000 feet northeast of	39 15 04.6	77 57 22.3	10,180

MARTINSBURG QUADRANGLE—Continued.

From Shepherdstown along highways via Harpers Ferry, Charles Town, and Summit Point to adjusted position at Middleway—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ′ ″	° ′ ″	*Feet.*
Summit Point, crossroad 1 mile north of, 40 feet south to gate, 70 feet north to gate	39 15 45.5	77 57 55.3	4,883
Crugers, four corners	39 16 11.7	77 58 51.9	5,181
T road west, 60 feet west to concrete bridge	39 17 37.6	77 59 06.2	8,762
Middleway, four corners at, 30 feet southwest to sign post "Bunkerhill"	39 18 12.5	77 58 58.9	3,571

Magnetic declination for south border of quadrangle, 5° 11′ W.; for east border, 4° 51′ W.; for west border, 5° 16′ W.

Near Mechanicsburg.

Mechanicsburg, middle of iron bridge 1 mile southwest of	39 15 03.4	77 50 26.8	.....
Mechanicsburg, four corners	39 15 42.0	77 49 53.5	4,700

STEPHENS CITY QUADRANGLE.

Near Wadesville.

Station.	Latitude.	Longitude.	Distance between stations.
VIRGINIA.			
	° ′ ″	° ′ ″	*Feet.*
Wadesville, highway crossing Baltimore & Ohio R. R. at	39 14 33.8	78 02 22.0	8,957
Swimley station, 15 feet south of Baltimore & Ohio R. R., 100 feet east of mail crane, and 70 feet west of crossing, in stone in place; tablet marked "Prim. Trav. Sta. No. 10, 1914"	39 14 34.2	78 00 28.0	8,965
Milepost No. 19, crossing near	39 14 45.1	77 58 39.8	8,580

WILLIAMSPORT QUADRANGLE.

Near Berkeley.

Station.	Latitude.	Longitude.	Distance between stations.
WEST VIRGINIA.			
	° ′ ″	° ′ ″	*Feet.*
Berkeley station, 0.25 mile northeast of, 60 feet north of bridge over railway, 15 feet west of west rail on Cumberland Valley R. R., and 10 feet north of whistle post in solid rock; regulation tablet stamped "Prim. Trav. Sta. No. 1, 1914"	39 30 15.4	78 55 26.4	.....
T road east on east side of Cumberland Valley R. R., 0.75 mile northeast of Berkeley	39 30 23.4	78 55 04.2	1,913

WEST VIRGINIA.

TRIANGULATION STATIONS.

Bluefield, Bramwell, Flattop, Hinton, and Peterstown 15′ quadrangles.

MERCER, MONROE, SUMMERS, AND WYOMING COUNTIES.

The following positions on North American datum are based on Pipestem, Huff, and Pilot (2) triangulation stations of the Geological Survey, established in 1909 and 1911. described in Bulletins 496 and 551.

The triangulation work was done by G. T. Hawkins in 1913.

BENT, MERCER COUNTY, W. VA.

On land owned by Mr. Ferguson, who lives about 1.5 miles northeast of Athens and 0.25 mile east of main road from Princeton to Hinton. The station is 0.3 mile nearly east from Mr. Ferguson's house on a bald knob of the mountain.

Station mark: Tablet in top of sandstone 8 by 12 by 30 inches set 26 inches in ground.

Reference marks: Stone in place 3 by 5 by 12 inches above ground, southeast 45 feet; locust tree, 6 inches in diameter, is southwest and over edge of hill 110 feet distant.

Signal: Tripod built of poles with white flagging on sides and flagpole.

[Latitude 37° 26′ 54.87″. Longitude 80° 59′ 30.23″.]

To station.	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Tank	41 06 04	221 02 29	4.1229100	8.246
Black	60 55 00.65	240 48 05.62	4.2841581	11.954
Pilot (2)	99 13 41	279 03 29	4.3996400	15.595
Huff	145 13 17.12	325 08 47.56	4.2796188	11.830
Pipestem	192 51 38.17	12 52 19.48	3.8744998	4.654
Elgood	323 05 25.08	143 07 25.49	3.9093799	5.043
Buckhorn	356 37 08.46	176 37 33.65	4.2389350	10.772

BLACK, MERCER COUNTY, W. VA.

On a partly cleared knob of Blackoak Mountain on land owned by Mr. Falkner, about 4 miles nearly due west from Princeton and 0.25 mile northwest of Mr. Falkner's house.

Station mark: A West Virginia tablet cemented in solid limestone ledge on east end of knob a few feet below the highest part.

Signal: White target about 50 feet above ground in a straight locust tree.

Reference marks: Rail fence 3 feet north; signal tree 12-inch locust 32.7 feet north.

[Latitude 37° 21′ 50.99″. Longitude 81° 10′ 53.44″.]

To station.	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Pilot (2)	149 07 34	329 04 17	4.1921700	9.672
Huff	193 17 04.19	13 19 30.57	4.4097207	15.961
Pipestem	227 51 35.32	47 59 11.93	4.3957866	15.457
Bent	240 48 05.62	60 55 00.65	4.2841581	11.954
Elgood	262 22 08.76	82 31 03.81	4.3399433	13.592
Tank	274 28 25	94 31 45	3.9092600	5.042
Buckhorn	293 55 16.84	114 02 36.30	4.2906578	12.134

BUCKHORN, GILES COUNTY, VA., AND MERCER COUNTY, W. VA.

On State line between Virginia and West Virginia on Buckhorn Ridge at its junction with New River Mountain, about 4 miles south from Oakvale and near old Geological Survey station of same name, which was not found.

Station mark: Tablet in solid rock.

Signal: An old snag with laurel brush woven in top and all brush near station cut down.

Reference marks: Crosses on rocks, one 6.5 feet west and the other 18.5 feet southeast.

[Latitude 37° 17′ 33.52″. Longitude 80° 58′ 48.72″.]

To station.	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Black	114 02 36.30	293 55 16.84	4.2906578	12.134
Bent	176 37 33.65	356 37 08.46	4.2389350	10.772
Elgood	199 36 42.53	19 38 17.55	4.0599738	7.134
Crotty	226 50 48.98	46 56 52.54	4.3052889	12.550

CROTTY, MONROE COUNTY, W. VA.

On Crotty Mountain, 1.5 miles northwest of Peterstown, on end of bare knob 125 feet north of road crossing ridge and 5 feet northwest of an apple tree. Mr. J. D. Reed is the owner of the land.

Station mark: Tablet in top of 30 by 18 by 5 inch sandstone block set 26 inches in ground.

Signal: Lone apple tree with targets.

Reference marks: Signal tree 5 feet southeast; wire fence 110 feet south.

[Latitude 37° 25′ 01.18″. Longitude 80° 48′ 49.53″.]

To station.	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Buckhorn	46 56 52.54	226 50 48.98	4.3052889	12.550
Elgood	74 41 30.38	254 37 01.57	4.0525628	7.013
Pipestem	127 33 44.24	307 27 55.79	4.2491108	11.027

ELGOOD, MERCER COUNTY, W. VA.

About 0.5 mile nearly south of Elgood post office on a knob with scattering trees on top and sides; there is a graveyard on top with fence around it. The point is about 300 yards west from road leading from Elgood to Oakdale.

Station mark: Tablet set in solid rock.

Signal: A poplar tree in graveyard with white targets.

Reference marks: Southwest corner of fence around graveyard is distant 37 feet. Cross on rock is N. 20° W. and distant 5.5 feet; another cross on a rock is S. 30° W., distant 9.3 feet.

[Latitude 37° 23′ 24.30″. Longitude 80° 56′ 12.07″.]

To station.	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Buckhorn	19 38 17.55	199 36 42.53	4.0599738	7.134
Black	82 31 03.81	262 22 08.76	4.3399433	13.592
Bent	143 07 25.49	323 05 25.08	3.9093799	5.043
Pipestem	166 56 32.36	346 55 13.12	4.1510756	8.799
Crotty	254 37 01.57	74 41 30.38	4.0525628	7.013

HUFF, MERCER-SUMMERS COUNTY LINE, W. VA.

About 75 feet northeast of highest point of Huff Knob of Flattop Mountains, The Knob is bare (now pasture) and is 0.4 mile a little north of west of store and post office of Flattop. It is near the line between Mercer and Summers counties and on land owned by B. W. Green and Albert Bolin, whose north-south fence line crosses near station. A good view can be obtained in all directions. The station mark is 4 feet east of north-south fence on line between B. W. Green and Albert Bolin, 210 feet south of a T fence east and 19.5 feet west of a dead chestnut snag 30 inches in diameter and 15 feet high.

Station mark: Bronze West Virginia tablet cemented in top of 6 by 6 by 24 inch sandstone post set 20 inches in ground.

Signal: Flags and targets in a dead chestnut snag 30 inches in diameter and 15 feet high, which stands 19.5 feet east of station and on east brink of knob.

[Latitude 37° 35′ 21.85″. Longitude 81° 06′ 52.85″.]

To station.	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Black[a]	13 19 30.57	193 17 04.19	4.4097207	15.961
Ivy	123 38 40.90	303 24 52.17	4.6003419	24.757
Phipps	156 24 04.99	336 19 46.98	4.4113864	16.023
Ellison	192 42 27.34	12 44 12.76	4.2831587	11.926
Freezeland	225 22 15.98	45 28 06.61	4.2956648	12.275
Wolf	275 45 15.75	95 54 53.06	4.3682683	14.508
Pipestem	303 33 47.29	123 38 58.44	4.1774183	9.349
Bent[a]	325 08 47.56	145 13 17.12	4.2796188	11.830

[a] By G. T. Hawkins in 1913; others by C. B. Kendall in 1911.

PILOT (2), WYOMING COUNTY, W. VA.

On a sharp cleared knob 0.5 mile southwest of Black post office. The road from Clark Gap to Black passes within 200 yards of station.

Station mark: A bronze tablet set in a sandstone post.

Signal: A quadripod signal covered with white cloth target.

Reference mark: A 1-inch hole drilled in ledge, true azimuth 293° 25′, distant 29.30 feet from station mark.

[Latitude 37° 29′ 04.23″. Longitude 81° 16′ 18.40″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Lambert	49 01 34.43	228 58 48.08	3.9497559	.....
Bearwallow	57 47 48.81	237 30 29.74	4.6978483	.....
Indian	91 33 42	271 23 08	4.4083000	.....
Hensley	91 47 04.18	271 30 04.14	4.6147933	.....
Burning Rock	121 51 19.31	301 35 44.06	4.6456523	.....
Shumate	133 49 28	313 41 48	4.4090900	.....
Ivy	150 08 29.83	330 00 27.44	4.5891176	.....
Phipps	185 41 21	5 42 53	4.5495200	.....
Bent[a]	279 03 29	99 13 41	4.3996400	15.595
Black[a]	329 04 17	149 07 34	4.1921700	9.672

[a] By G. T. Hawkins in 1913; others by Oscar Jones in 1909.

PIPESTEM, MERCER COUNTY, W. VA.

On highest part of Pipestem Knob, 2.25 miles a little west of south of Pipestem and 0.5 mile west of the Pipestem Primitive Baptist Church. The knob is owned by E. V. Neely, whose dwelling is at the south foot of the knob. The knob is cleared with exception of small trees on north and west slopes.

Station mark: A bronze West Virginia tablet cemented in top of 6 by 6 by 30 inch sandstone set 26 inches in ground.

Signal: A pole quadripod with flag and targets over station mark.

Reference marks: No. 1 is triangle cut on apple tree, distant 37.5 feet, true azimuth 107° 06′; No. 2 is triangle cut on apple tree, distant 96.2 feet, true azimuth 133° 46′; No. 3 is triangle cut on apple tree, distant 126 feet, true azimuth 166° 09′.

[Latitude 37° 30′ 51.73″. Longitude 80° 58′ 22.34″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Bent [a]	12 52 19.48	192 51 38.17	3.8744998	4.654
Black [a]	47 59 11.93	227 51 35.32	4.3957866	15.457
Huff	123 38 58.44	303 33 47.29	4.1774183	9.349
Freezeland	184 00 26.52	4 01 05.26	4.3472911	13.824
Wolf	240 53 04.06	60 57 29.80	4.0881705	7.612
Hightop	253 57 31.92	74 07 15.41	4.3882466	15.191
Crotty [a]	307 27 55.79	127 33 44.24	4.2491108	11.027
Elgood [a]	346 55 13.12	166 56 32.36	4.1510756	8.799

[a] By G. T. Hawkins in 1913; others by C. B. Kendall in 1911.

PRINCETON TANK, MERCER COUNTY, W. VA. (Not occupied.)

A large iron water tank about 70 feet above ground in southeast part of Princeton.
Station mark: Center of tank.

[Latitude 37° 21′ 30.33″. Longitude 81° 05′ 24.73″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Black	94 31 45	274 28 25	3.90926	5.042
Bent	221 02 29	41 06 04	4.12291	8.246

Hacker Valley and Pickens quadrangles.

BRAXTON, POCAHONTAS, RANDOLPH, UPSHUR, AND WEBSTER COUNTIES.

In 1913 C. B. Kendall extended triangulation southward from Big Run (2) and Sugar (2), described in Bulletin 551, into Hacker Valley and Pickens quadrangles. He occupied four new stations and located seven points by intersections on North American datum.

BIG RUN NO. (2¹), UPSHUR COUNTY, W. VA.

On mountain at head of Big Run, about 1.5 miles east of Holly Grove, on land owned by Mrs. C. E. Carpenter, who lives on ridge on southeast side of knob.

Station mark: A sandstone post 11 inches square by 30 inches long sunk 26 inches in ground, in center of top of which is cemented a bronze triangulation tablet.

Theodolite elevated 70 feet on tower. Observer on platform in tree.

[Latitude 38° 47′ 40.77″. Longitude 80° 15′ 31.35″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Degarmo	9 39 16.23	189 38 26.49	4.0588994	7.116
Sugar	89 50 11.54	269 42 04.18	4.2735297	11.665
Devils Darning Needle	95 14 00.30	275 07 00.02	4.2108742	10.098
Handkerchief	122 51 39.16	302 45 53.27	4.1994971	9.837
Bald	132 44 40.91	312 37 04.68	4.3773554	14.815
Sugarloaf	135 14 35.08	315 03 05.23	4.5741980	23.310
Bear	174 42 06.26	354 40 55.67	4.4662017	18.178
Goinour	179 07 10.67	359 07 02.69	4.2991526	12.374
Leonard	182 42 14.95	2 42 40.63	4.3194062	12.964
Proudfoot	225 27 50.45	45 35 56.65	4.4177237	16.258
Moore	293 03 36.49	113 09 15.35	4.1523921	8.826
Big Run No. 1	207 08 37	.....	1.6894800	(a)
Buffalo	41 45 55	221 42 05	4.1256000	8.298
Turkey Bone	341 17 22.15	161 19 58.43	4.2750312	11.705
Winkler	341 05 34.42	161 08 35.53	4.3349752	13.438

[a] 160.5 feet.

BUCKWHEAT, RANDOLPH COUNTY, W. VA. (Not occupied.)

Flag in top of a tall sugar-maple tree, 30 feet east of the center of the Hacker Valley and Pickens public road and 135 feet south of the front door of the Buckwheat Church, about 3 miles northwest of Pickens.

Signal and station mark: Flag in tree.

[Latitude 38° 39′ 37.23″. Longitude 80° 15′ 28.65″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Potato	13 30 44	193 29 12	4.18502	9.514
Degarmo	151 15 05	331 14 14	3.61583	2.566
Turkey Bone	296 08 00	116 10 34	3.82341	4.138
Winkler	308 38 09	128 41 08	3.94886	5.524

BUFFALO, WEBSTER COUNTY, W. VA. (Not occupied.)

Ten angles taken to this point from each of six occupied stations. A very prominent lone tree which stands on the northeast end of a cleared ridge about 0.5 mile east of the Buffalo Run public road at a point about 2 miles southeast of Cleveland. The ridge extends northeast. The northeast end is cleared and the southwest timbered. Tree stands a few feet southwest of where ridge falls off to the northeast.

Signal and station mark: The tree, which was not flagged.

[Latitude 38° 42′ 17.60″. Longitude 80° 21′ 39.44″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Sugar	135 01 04	314 56 47	4.14582	8.692
Big Run	221 42 05	41 45 55	4.12560	8.298
Degarmo	280 44 03	100 46 57	3.85122	4.411
Potato	344 45 22	164 47 42	4.31290	12.772

CHEAT, POCAHONTAS COUNTY, W. VA. (Not occupied; sighted from only two stations.)

Highest point of the Cheat Mountains, about 4 miles southeast of Mingo post office and about 1½ miles northwest of gap through which the Cheat River Lumber Co.'s log road passes. Mountain is very difficult of ascent on account of windfall and briars.

Station mark and signal: Flag and targets in pine tree, highest on mountain.

(No check on this position.)

[Latitude 38° 27′ 48.13″. Longitude 79° 58′ 05.93″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Potato	103 41 56	283 29 35	4.47247	18.443
Winkler	131 46 20	311 38 29	4.38950	15.235

COOL SPRING, WEBSTER COUNTY, W. VA. (Not occupied.)

On the northeast end of the Cool Spring knob at the head of the Cool Spring run. The knob is the highest part of the divide between Holly River, Grassy Creek, and the left fork of Grassy and is about 2½ miles southwest of Jumbo and 2 miles southeast of Diana. Station is about 100 feet southwest of where the ridge begins to break off to the northeast and is near the east slope of ridge, about 200 feet west of the west fence along edge of meadow field on hillside on the left fork of Grassy Creek slope.

Signal: Flag and targets in a tall hickory tree 2 feet in diameter.

Station mark: A bronze West Virginia tablet in top of a sandstone block 8 inches by 12 inches by 30 inches set 24 inches in ground directly under signal.

[Latitude 38° 33′ 00.08″. Longitude 80° 25′ 51.53″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Degarmo	219 27 26	39 33 03	4.31307	12.780
Turkey Bone	246 03 29	66 12 44	4.36224	14.308
Potato	282 53 14	102 58 10	4.07215	7.337

DEGARMO, WEBSTER COUNTY, W. VA.

On a slightly elevated timbered point of the Buckwheat ridge about 500 feet west of the public road between Buckwheat Church and Goshen Church, 3 miles northwest of the former and 2½ miles southeast of the latter. Station is 450 feet west of S. C. Degarmo's residence and about 700 feet southwest of the corner of Randolph, Upshur, and Webster counties.

Signal: Flag and targets in top of large red-oak tree, 60 feet west of the corner of a rail fence at a private graveyard. A platform was erected in top of signal tree 90 feet above ground and a quadripod of dead poles was extended from the crotch of three forks of the tree for instrument stand; tree was guyed by wire and was fairly steady. Instrument was elevated 95 feet.

Station mark: A sandstone 10 by 12 by 30 inches set 26 inches in ground in top of which was set a bronze tablet. Stone set directly under instrument and is 4.8 feet northwest of signal.

[Latitude 38° 41′ 34.62″. Longitude 80° 16′ 50.82″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Potato	4 54 13.34	184 53 32.44	4.2689326	11.542
Cool Spring	39 33 03	219 27 26	4.3130700	12.780
Buffalo	100 46 57	280 44 03	3.8512200	4.411
Sugar	123 40 51.03	303 33 33.94	4.3065278	12.586
Big Run	189 38 26.49	9 39 16.23	4.0588994	7.116
Turkey Bone	309 25 55.16	129 29 20.90	4.0133639	6.408
Winkler	313 44 53.05	135 48 43.59	4.1071315	7.952
Buckwheat	331 14 14	151 15 05	3.6158300	2.566

ELK, RANDOLPH COUNTY, W. VA. (Not occupied; sighted from two points only.)

On the highest part of Elk Mountain, which lies between the valley fork and Dry Branch of Elk River, and about 3½ miles west of Mingo and 3 miles southwest of Blue Spring post office. Can be easily reached from Mingo by road to Mr. Hamrick's dwelling, thence by trail to a farm on the east end of mountain, thence by sheep trail along ridge to a point where oak, etc., timber gives way to pine exclusively.

Signal and station mark: Flag and targets in top of a pine tree 135 feet high. Tree is cleated and stands about 150 feet northwest of the very top of ridge. Signal tree is the tallest tree on ridge.

(No check on this position.)

[Latitude 38° 30′ 11.24″. Longitude 80° 06′ 14.96″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Potato	98 38 34	278 31 17	4.23515	10.678
Winkler	151 31 58	331 29 12	4.13162	8.413

LONE TREE, RANDOLPH COUNTY, W. VA. (Not occupied.)

A lone dead pine tree standing on the highest part of a fire-scaled knob of Rich Mountain at the head of Beech Run, about 3 miles along an old trail (now impassable) which leaves the Pickens and Monterville Park road at Whetman Knob. Station will be hard to identify except from a distance. There are other dead pines on the hill but none very near nor as high.

Signal and station mark: The tree, not flagged.

(No check on this position.)

[Latitude 38° 38′ 53.42″. Longitude 80° 05′ 49.72″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Winkler	59 16 49	239 13 47	3.91476	5.106
Turkey Bone	78 51 55	258 48 28	3.91269	5.082

MORGAN, RANDOLPH COUNTY, W. VA. (Not occupied.)

On the northeast end of a prominent cleared knob on the south edge of the Pickens and Webster Springs public road at a point about 3½ miles southwest of Pickens and three-fourths mile northeast of the Morgan school. Land is owned by Mr. Morgan, who lives on the same road about three-fourths mile northeast of station.

Signal and station mark: Flag in chestnut tree which stands a few feet northeast of the northeast end of knob.

[Latitude 38° 36′ 47.52″. Longitude 80° 14′ 13.68″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Potato	29 11 58	209 09 53	4.04372	6.872
Turkey Bone	241 05 24	61 07 11	3.67735	2.955
Winkler	273 32 22	93 34 34	3.71081	3.192

POTATO, WEBSTER COUNTY, W. VA.[1]

On the highest part of Potato Knob, of the Paint Mountains, at the head of Potato Knob Run and about 1 mile northeast of Woodzell post office.

Station is on land owned by Clark Stolnaker and is about one-half mile east of his residence. A small pasture field is about 500 feet west of station and the Staunton-Slovens old State road along the top of Paint Mountain passes around the hill about 1,000 feet south. Paint Mountain Methodist Church is about 1 mile southwest.

Signal: Flag and targets in top of a large sugar maple, which overlooks other trees in every direction, affording a good view all around; a quadripod of dead poles was erected in crotch of forks of tree and extends 32 feet up for instrument stand. Observing platform in top of tree is 82 feet above ground, the corners of which were securely guyed. Tree was very steady. Instrument elevated 86 feet.

Station mark: A sandstone block 8 by 10 by 30 inches, set 24 inches in ground, in top of which is a bronze West Virginia tablet. Three reference marks were left, consisting of small triangles cut on trees.

Azimuths and distances from station mark to reference marks:

	Azimuth.		Distance from station mark (feet).
	°	′	
No. 1	358	03	49.65
No. 2	89	03	31.42
No. 3	279	23	8.14

A wire nail was driven in center of each triangle. Station mark set directly under center of instrument.

[1] See p. 630.

[Latitude 38° 31′ 34.41″. Longitude 80° 17′ 56.37″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Cool Spring	102 58 10	282 53 14	4.0721500	7.337
Sugar	152 48 53.03	332 42 17.68	4.5241307	20.772
Buffalo	164 47 42	344 45 22	4.3129000	12.772
Degarmo	184 53 32.44	4 54 13.34	4.2689326	11.542
Buckwheat	193 29 12	13 30 44	4.1850200	9.514
Morgan	209 09 53	29 11 58	4.0437200	6.872
Turkey Bone	218 36 41.28	38 40 47.52	4.1848220	9.510
Winkler	228 22 58.07	48 27 29.05	4.1481982	8.741
Elk	278 31 17	98 38 34	4.2351500	10.678
Cheat	283 29 35	103 41 56	4.4724700	18.443

SUGAR NO. 2, BRAXTON COUNTY, W. VA.

On mountain locally known as Sugar Knob, about 2 miles south from Ireland, on land of W. S. Bird.

Station mark: A sandstone block 11 by 13 by 24 inches, set 22 inches in ground, in center of top of which is cemented a bronze triangulation tablet.

Reference mark: A conspicuous large white oak tree 3.7 feet in diameter, 69.1 feet distant, 196° 17′ true azimuth from station.

[Latitude 38° 47′ 38.31″. Longitude 80° 28′ 29.23″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Sugarloaf	163 53 23.18	343 50 01.97	4.4434927	17.252
Bald	184 18 45.17	4 19 17.09	4.2117985	10.119
Bear	208 42 20.84	28 49 19.00	4.5226559	20.702
Handkerchief	212 13 02.82	32 15 24.71	4.0099390	6.358
Devils Darning Needle	239 11 39.69	59 12 46.85	3.4786949	1.871
Big Run No. 2	269 42 04.18	89 50 11.54	4.2735297	11.665
Degarmo	303 33 33.94	123 40 51.03	4.3065278	12.586
Buffalo	314 56 47	135 01 04	4.1458200	8.692
Potato	332 42 17.68	152 48 53.03	4.5241307	20.772

TURKEY BONE, RANDOLPH COUNTY, W. VA.

On the highest part of Little Turkey Bone Mountain, which is situated about 2 miles southeast of Pickens, 1,000 feet northeast of the Pickens-Monterville road where it crosses the ridge in gap between the Big and Little Turkey Bone Mountains. Land is owned by the Pickens estate.

Signal: Flag and targets in a cherry tree 3 feet in diameter which stands about 25 feet north of highest part of mountain. A dead chestnut pole, well guyed, extends from the ground for instrument stand.

Station mark: A 6 by 12 by 30 inch sandstone block set 24 inches in ground in the top of which is cemented a bronze West Virginia triangulation tablet.

Reference marks: Triangles cut as follows:

On beech tree, magnetic azimuth 253°; distance 22.65 feet.

On oak tree, magnetic azimuth 113°; distance 27.32 feet.

On oak tree, magnetic azimuth 17°; distance 33.49 feet.

On cherry signal tree, magnetic azimuth 333°; distance 4.95 feet.

Distance, tablet to signal, 3.4 feet; height of platform, 53.5 feet; height of instrument, 58.5 feet.

[Latitude 38° 38′ 02.07″. Longitude 80° 11′ 21.51″.]

To station—	Azimuth.	Back azimuth.	Diatsnce.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Potato	38 40 47.52	218 36 41.28	4.1848220	9.510
Morgan	61 07 11	241 05 24	3.6773500	2.955
Cool Spring	66 12 44	246 03 29	4.3622400	14.308
Buckwheat	116 10 15	296 07 41	3.8233400	4.138
Degarmo	129 29 20.90	309 25 55.16	4.0133639	6.408
Big Run	161 19 58.43	341 17 22.15	4.2750312	11.705
Lone Tree	258 48 28	78 51 55	3.9126900	5.082
Winkler	339 48 29.95	159 48 54.79	3.4454426	1.733

WINKLER, RANDOLPH COUNTY, W. VA.

On the highest part of Winkler Knob, which is between the heads of Back Fork of Elk Creek and Sugar Creek and is 3½ miles southeast of Pickens and 1 mile south of the Pickens-Monterville public road. The highest point of knob is formed by a loose sandstone ledge about 10 feet high; the station is on the west edge of ledge opposite the center. The ledge is about 100 feet wide east and west and 250 feet north and south.

Signal: Flag and targets in birch tree which stands on west edge of ledge and is not very secure, as it has no roots on the west side. A platform of poles was built in the very top of tree 47 feet above ground and a pole, well guyed, was erected for instrument support.

Station mark: Bronze West Virginia tablet set in solid sandstone ledge between the roots of signal tree upon which the instrument pole was set and plumbed so that instrument was directly over tablet.

Reference marks: Triangles cut as follows:

No. 1, on 18-inch birch, azimuth 38.04°; distance 38.2 feet.

No. 2, on 18-inch sugar maple, azimuth 153.15°; distance 23.5 feet.

No. 3, on 6-inch birch, azimuth 283.43°; distance 26.6 feet.

No. 4, on 18-inch birch, azimuth 348.51°; distance 29.3 feet.

[Latitude 38° 36′ 37.18″. Longitude 80° 10′ 41.72″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Potato	48 27 29.05	228 22 58.07	4.1481982	8.741
Morgan	93 34 34	273 32 22	3.7108100	3.192
Buckwheat	128 41 08	308 38 09	3.9488600	5.524
Degarmo	135 48 43.59	315 44 53.05	4.1071315	7.952
Big Run	161 08 35.53	341 05 34.42	4.3349752	13.438
Turkey Bone	159 48 54.79	339 48 29.95	3.4454426	1.733
Lone Tree	239 13 47	59 16 49	3.9147600	5.106
Cheat	311 38 29	131 46 20	4.3895000	15.235
Elk	331 29 12	151 31 58	4.1316200	8.413

Summersville and Winona quadrangles.

FAYETTE, GREENBRIER, AND NICHOLAS COUNTIES.

During the season of 1913 Geo. T. Hawkins extended triangulation northward from Boggs and Meador, established by C. B. Kendall in 1911 (described in Bulletin 551) and connected with Summersville station of the Coast and Geodetic Survey. Seven new stations were occupied and one point was located by intersections, all being on North American datum.

BOGGS, GREENBRIER COUNTY, W. VA.

On southeast slope near south end of Boggs Knob, which is highest part of ridge between Sewell and Little Sewell creeks. It is 3.5 miles northeast of Springdale on land owned by Mr. Tuicher, who lives at foot of knob about 0.25 mile west of station. The knob is broad and flat on top with a fringe of timber bordering all sides except north and northwest. Timber was cut around station, so that view is unobstructed from south around to north. The station mark is on east edge of cleared space 30.7 feet southeast of large white-oak tree used as a signal tree and standing alone, and 120 feet north of a trail leading from point of knob down to Mr. Tuicher's dwelling.

Station mark: A bronze West Virginia tablet set in top of large flat sandstone bowlder.

Signal: Flags and targets in top of 36-inch white-oak tree standing alone 30.7 feet northwest of station mark.

Reference marks: No. 1 is triangle cut on 8-inch chestnut tree, distant 33.2 feet, true azimuth 320° 13′; No. 2 is triangle cut on 36-inch white-oak tree (signal tree) distant 29.3 feet, true azimuth 124°; Nos. 3, 4, and 5 are 1-inch drill holes in bowlders for tripod rests.

[Latitude 37° 55′ 05.21″. Longitude 80° 46′ 51.27″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Freezeland	34 13 02.94	214 06 38.13	4.4367133	16.985
Ellison	54 52 20.23	234 41 48.95	4.4885504	19.138
Meador	93 41 53.79	273 34 54.39	4.2227273	10.377
Alpha	108 05 29.41	287 51 23.53	4.5475704	21.924
Sewell [a]	159 24 02.37	339 23 02.41	3.8302075	4.203
Sugar Grove [a]	174 05 08.31	354 04 15.30	4.3086850	12.648
Keeney	337 27 14.53	157 30 01.46	4.2396984	10.791

[a] By G. T. Hawkins in 1913.

GRINDSTONE, FAYETTE COUNTY, W. VA.

On southeastern one of three knobs on Dogwood Ridge about 1.5 miles northwest of Clifty post office and 0.5 mile north of S. V. Kisler's store (a good place to stop). The knob was cleared of timber except for sugar-maple tree 24 inches in diameter, which was used for signal, and a few small locusts on east side of knob.

Station mark: Sandstone block 7 by 8 by 30 inches set 26 inches in ground, with tablet in top.

Signal: Sugar maple 24 inches in diameter, with white targets.

Reference marks: Sugar maple 24 inches in diameter, 8.5 feet northeast. Corner of three rail fences 12 feet north.

[Latitude 38° 09′ 46.16″. Longitude 80° 59′ 37.04″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Gross	191 32 46.92	11 34 20.67	4.2643220	11.420
Summersville	219 31 26.91	39 36 04.91	4.2345072	10.662
Nebo	251 02 25.24	71 07 27.44	4.0996140	7.816
Sugar	292 36 42.69	112 43 42.37	4.2538129	11.147
Hane	315 04 05	135 07 30	4.0587400	7.114
Sewell	321 55 01.81	142 01 53.87	4.4223125	16.431
Holliday	327 13 53.25	147 17 33.04	4.2054082	9.971
Meador	355 29 12	175 29 58	4.4174500	16.248

GROSS, NICHOLAS COUNTY, W. VA.

Knob on Twentymile Mountain, about 10 miles northwest from Summersville, and 2 miles northwest of Gilboa. It is on land owned by Frank Gross and 300 yards northeast of an old house; 200 yards south of small vacant house, on line of rail fence northsouth and 100 feet west of second-class road. The knob is cleared on west; and good views may be had from south through west to north. Lines were cut through timber to other points.

Station mark: Sandstone block 10 by 12 by 24 feet set 20 inches in ground with tablet in top.

Signal: Chestnut tree with tuft in top and white targets.

Reference mark: Chestnut signal tree, 14.5 feet distant, true azimuth 267° from station mark.

[Latitude 38° 19′ 30.16″. Longitude 80° 57′ 05.59″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Grindstone	11 34 20.67	191 32 46.92	4.2643220	11.420
Hill	240 37 51.97	60 44 21.67	4.2425978	10.863
Summersville	303 24 12.26	123 27 16.88	3.9381178	5.389

HANE, FAYETTE COUNTY, W. VA. (Not occupied.)

One mile north of Russellville on land owned by Mr. Hane. A bald hill with a few walnut trees on top and a small inclosure with three graves on highest point.

Station mark: Tallest walnut tree, which stands on top a short distance north of graves.

[Latitude 38° 05′ 23.20″. Longitude 80° 54′ 05.30″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Grindstone	135 07 30	315 04 05	4.05874	7.114
Nebo	197 25 12	17 26 49	4.10626	7.936
Holliday	353 41 23	173 42 11	3.73398	3.368

HILL, NICHOLAS COUNTY, W. VA.

About 10 miles north by 3 miles east of Summersville, 2 miles northeast of old Hookersville post office, on highest knob in neighborhood, and about 0.8 mile south of McCoy's field. The point is heavily wooded on top; station is near the southeast end of the knob.

Station mark: Tablet cemented in rock.

Signal: 30-inch red-oak tree.

Reference marks: Triangles on trees; 14-inch chestnut tree 20 feet northwest; 30-inch chestnut tree 10 feet southwest; and 18-inch hickory tree 16 feet northeast.

[Latitude 38° 24′ 07.76″. Longitude 80° 46′ 37.70″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Nebo	17 26 55.64	197 23 55.61	4.3723448	14.645
Summersville	31 01 52.97	210 58 28.23	4.1920018	9.668
Gross	60 44 21.67	240 37 51.97	4.2425978	10.863

HOLLIDAY, FAYETTE COUNT, W. VA.

On cleared knob with fringe of trees on south, 3 miles north of Ravenseye post office and 1.5 miles north of west from Corlis post office, on land owned by Mr. Holliday. Good view from west around through north to southeast.

Station mark: Sandstone block 6 by 10 by 30 inches set 28 inches in ground, with tablet in top.

Signal: Cloth targets in dead chestnut.

Reference marks: Large stump south 20° east, distant 57 feet; T fence northeast, distant 34 feet.

[Latitude 38° 02′ 28.36″. Longitude 80° 53′ 40.85″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Meador	27 52 13	207 49 28	4.1539600	8.857
Grindstone	147 17 33.04	327 13 53.25	4.2054082	9.971
Hane	173 42 11	353 41 23	3.7339800	3.368
Nebo	190 24 31.49	10 25 53.39	4.2521508	11.105
Sugar	230 06 38.35	50 09 57.83	4.0116774	6.383

MEADOR, FAYETTE COUNTY, W. VA.

On highest part of cleared (meadow) ridge owned by John L. Meador, about 2.25 miles northwest of Big Sewell Mountain and 1.5 miles northwest of Mount Ida. Mr. Meador's dwelling is at foot of ridge about 0.5 mile a little southeast of station. The station is about midway between two rail fences which inclose a meadow field and is about 130 feet northeast of southwest slope of the last rise of hill and 7.4 feet west of a 14-inch dead chestnut snag.

Station mark: A 6 by 6 by 30 inch sandstone post set 26 inches in ground, in top of which is cemented a bronze West Virginia tablet. The stone is 7.4 feet west of a 14-inch dead chestnut snag and 3.8 feet west of signal pole.

Signal: A 40-foot chestnut pole set in ground and braced to dead chestnut snag. Pole carries flags and targets.

Reference marks: No. 1 is stone pile 6 feet in diameter, 18.4 feet, distant, true azimuth 333° 48′; No. 2 is 6-foot stone pile distant 53.3 feet, true azimuth 104° 32′; No. 3 is small triangle cut on apple tree distant 144.5 feet, true azimuth 215° 09′.

[Latitude 37° 55′ 39.60″. Longitude 80° 58′ 13.66″.

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Plumley	1 17 14	181 17 12	4.0992600	7.809
Ellison	24 16 33.41	204 13 00.71	4.3147530	12.826
Phipps	58 54 05.55	238 44 27.87	4.4295650	16.708
Paint	94 20 46.67	274 08 18.59	4.4741306	18.513
Alpha	120 13 57.92	300 06 51.81	4.2912120	12.150
Grindstone	175 29 58	355 29 12	4.4174500	16.248
Holliday [a]	207 49 28	27 52 13	4.1539600	8.857
Sugar Grove [a]	217 06 58.01	37 13 05.25	4.3816100	14.961
Sewell [a]	249 41 23.24	69 47 22.94	4.1824569	9.458
Boggs	273 34 54.39	93 41 53.79	4.2227273	10.377
Freezeland	356 45 17.86	176 45 51.45	4.3750376	14.736

[a] By G. T. Hawkins in 1913.

NEBO, NICHOLAS COUNTY, W. VA.

About 8 miles nearly south of Summersville and 0.5 mile west of Nebo post office, on a low, bald knob, which is cultivated and has a double locust tree standing on highest part. It is on land owned by Mr. King, whose house is 150 yards southwest from signal.

Station mark: Standstone block 8 by 8 by 30 inches with cross and letters "U. S. G. S." cut on top, set 30 inches in ground.

Signal: Double locust standing on highest part of knob.

Reference marks: Double locust N. 70° W., distant 24 feet; dead walnut snag N. 70° E. distant 125 feet. A plank fence is 50 feet south.

[Latitude 38° 11′ 58.42″. Longitude 80° 51′ 28.16′.

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Holliday	10 25 53.39	190 24 31.49	4.2521508	11.105
Hane	17 26 49	197 25 12	4.1062600	7.936
Grindstone	71 07 27.44	251 02 25.24	4.0996140	7.816
Summersville	173 59 59.25	353 59 34.76	3.9638515	5.717
Hill	197 23 55.61	17 26 55.64	4.3723448	14.645
Sugar	337 04 23.53	157 06 21.39	4.0767756	7.415

SEWELL, GREENBRIER COUNTY, W. VA.

Highest knob on Big Sewell Mountain, 2 miles northwest from Rainelle on land owned by Mr. Miles. Station can be reached by going 2 miles northwest from Rainelle to schoolhouse on top of hill, thence along wood road leading through gate to top, which is cultivated field with a barn standing on highest part. The west comb of roof was used for signal, and lines were cut through timber north and northwest.

Station mark: Sandstone block 10 by 10 by 30 inches set 28 inches in ground, with tablet in top.

Signal: West comb of roof of barn in cultivated field.

Reference marks: Northwest corner of barn is southeast, distant 4 feet; southwest corner of barn is S. 20° E., distant 30 feet.

[Latitude 37° 58′ 30.56″. Longitude 80° 48′ 28.78″.]

To station.	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Meador	69 47 22.94	249 41 23.24	4.1824569	9.458
Grindstone	142 01 53.87	321 55 01.81	4.4223125	16.431
Sugar	181 08 44.11	1 08 51.15	4.1435945	8.649
Boggs	339 23 02.41	159 24 02.37	3.8302075	4.203

SUGAR GROVE, NICHOLAS COUNTY, W. VA.

About 7 miles east of Russellville post office and 150 yards west from the Sugar Grove Church on land owned by Joseph Nutter, and 200 yards north from his house on a cleared ridge. A good view can be obtained from southeast around through south and west to north.

Station mark: Sandstone block 6 by 8 by 30 inches, set 28 inches in ground, with tablet in top.

Signal: Sawed lumber tripod with targets.

Reference marks: Old chestnut stump S. 10° E., distant 40 feet.

[Latitude 38° 06′ 01.90″. Longitude 80° 48′ 17.36″.

To station.	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Sewell	1 08 51.15	181 08 44.11	4.1435945	8.649
Meador	37 13 05.25	217 06 58.01	4.3816100	14.961
Holliday	50 09 57.83	230 06 38.35	4.0116774	6.383
Grindstone	112 43 42.37	292 36 42.69	4.2538129	11.147
Nebo	157 06 21.39	337 04 23.53	4.0767756	7.415
Boggs	354 04 15.30	174 05 08.31	4.3086850	12.648

SUMMERSVILLE (PINE), NICHOLAS COUNTY, W. VA.[1]

A Coast and Geodetic Survey triangulation station on a ridge 1 mile from Nicholas courthouse belfry and bearing 6° north of west. A large tree left standing is visible for 40 miles. A spike is driven into this tree and station bears 354° 40′, distant 15.4 feet from this spike. Nearest railroad station is Kanawha Falls, on Chesapeake & Ohio R. R., 32 miles distant.

Station mark: Bottle set into a hole with sandstone block placed over it, 6 by 6 by 30 inches, and cross cut on top.

Reference marks: Four sandstone blocks set north, south, east, and west, with arrow cut on top pointing to center; distance, north block 7.02 feet, south block 7 feet, east block 7.29 feet, and west block 6.90 feet.

[Latitude 38° 16′ 55.36″, C. & G. S.; 38° 16′ 55.21″, U. S. G. S. Longitude 80° 52′ 07.75″, C. &. G. S.; 80° 52′ 07.73″, U. S. G. S.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Grindstone [a]	39 36 04.91	219 31 26.91	4.2345072	10.662
Ivy	45 04 21.2	224 41 20.6	4.8889487	.....
Gross [a]	123 27 16.88	303 24 12.26	3.9381178	5.389
Hill [a]	210 58 28.23	31 01 52.97	4.1920018	9.668
Nebo [a]	353 59 34.76	173 59 59.25	3.9638515	5.717
Beech	309 07 23.1	129 17 09.9	4.4741263	.....

[a] By G. T. Hawkins, 1913.

Cowen, Richwood, and Webster Springs quadrangles.

NICHOLAS AND WEBSTER COUNTIES.

In the summer of 1915 Oscar Jones established 15 new triangulation points for the control of the above-named 15-minute quadrangles, based on Beech and Summersville stations of the United States Coast and Geodetic Survey. He also connected with Nebo and Potato, stations previously located by the United States Geological Survey, all on North American datum.

BEECH, GREENBRIER COUNTY, W. VA.

About 11 miles northeast of Snow Hill post office and 4 miles north of the house of Albert G. Williams, on the highest point of Beech Knob. The station is marked by a cross in the top of a rough sandstone post 6 inches square and 2 feet long. There are four reference marks, each consisting of a rough sandstone post marked with a drill hole, at the following distances and directions from the station: 2.10 meters north, 2.08 meters east, 2.13 meters south, and 2.16 meters west.

[Latitude, 38° 06′ 44.56″. Longitude, 80° 36′ 18.96″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Briery	261 06 00.41	81 15 39.86	4.3642015	.....
Keeney	13 11 42.73	193 08 01.24	4.5868192	.....
Nebo	113 41 59.80	293 32 38.08	4.3831111	15.01
Summersville	129 17 09.86	309 07 23.15	4.4741263	18.52
Fury	133 33 15.25	313 28 05.53	4.2259592	10.45
Cottle	172 23 08.17	352 21 34.51	4.4429405	17.23
Collins	180 44 15.48	0 44 19.90	4.1300307	8.38
Madden	184 09 51.43	4 10 25.69	4.2682733	11.53
Cowen	191 08 05.62	11 10 43.87	4.5067203	19.96
Hunter	211 51 02.02	31 55 56.49	4.3411195	13.63

[1] See p. 632.

CLIFF, WEBSTER COUNTY, W. VA.

On Cliff Knob, 12 miles northeast of Richwood. Knob is timbered on north.
Station mark: Tablet in sandstone ledge.

[Latitude 38° 17′ 48.94″. Longitude 80° 27′ 00.63″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Hunter	46 59 43.78	226 58 52.91	3.4359976	1.70
Madden	80 48 36.88	260 43 25.26	4.0928161	7.70
Cottle	112 09 40.12	292 02 20.01	4.2696099	11.56

COLLINS, NICHOLAS COUNTY, W. VA.

On a cleared hill 2 miles east of Fenwick, on land owned by Mr. George Collins, who lives 200 yards southwest of station.
Station mark: A large dead chestnut tree on highest point of hill; four spikes driven in blazes 2 feet above ground.

[Latitude 38° 14′ 02.07″. Longitude 80° 36′ 11.82″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Summersville	103 01 44.41	282 51 52.49	4.3774466	14.82
Cottle	164 37 40.63	344 36 02.42	4.1618106	9.02
Beech	0 44 19.90	180 44 15.48	4.1300307	8.38

COTTLE, NICHOLAS COUNTY, W. VA.

On Cottle Knob, 2 miles west of Camden-on-Gauley. Knob was partly cleared of timber. Instrument elevated 40 feet.
Station mark: Tablet in sandstone post.

[Latitude 38° 21′ 35.95″. Longitude 80° 38′ 50.30″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Fury	28 10 08.76	208 06 31.96	4.2560235	11.20
Nebo	46 02 32.01	225 54 42.49	4.4085366	15.92
Wild Cat	58 48 58.17	238 45 50.25	3.9346042	5.35
Summersville	66 00 09.43	245 51 54.95	4.3266599	13.18
Locust	220 52 38.30	40 57 32.01	4.2431778	10.88
Miller	233 24 07.48	53 33 06.60	4.4179601	16.27
Potato	238 36 14.95	58 49 14.47	4.5512013	22.11
Payne	241 40 28.32	61 49 12.49	4.3662056	14.44
Cowen	247 47 38.66	67 51 51.30	4.0279891	6.63
Mitten	265 43 00.44	85 53 24.39	4.3886063	15.20
Red Oak	272 17 33.55	92 25 14.80	4.2567703	11.22
Cliff	292 02 20.01	112 09 40.12	4.2696099	11.56
Hunter	300 06 46.94	120 13 16.06	4.2463215	10.96
Madden	330 46 52.25	150 49 00.44	4.0126026	6.40
Collins	344 36 02.42	164 37 40.63	4.1618106	9.02
Beech	352 21 34.51	172 23 08.17	4.4429405	17.23

COWEN, WEBSTER COUNTY, W. VA.

On a high cleared knob 2 miles southeast of Cowen.
Station mark: Tablet in sandstone bowlder.

[Latitude 38° 23′ 46.48″. Longitude 80° 32′ 03.38″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Beech	11 10 43.87	191 08 05.62	4.5067203	19.96
Madden	20 30 17.84	200 28 13.66	4.0126903	8.06
Cottle	67 51 51.30	247 47 38.66	4.0279891	6.63
Locust	189 49 13.24	9 49 54.10	3.9703534	5.81
Payne	236 36 07.31	56 40 38.78	4.1032736	7.88
Red Oak	300 15 09.46	120 18 38.27	3.9756573	5.88
Hunter	337 24 06.44	157 26 23.30	4.1447457	8.69

FURY, NICHOLAS COUNTY, W. VA.

On a well-known cleared knob called Fury Knob, 11 miles southeast of Summersville, W. Va., on land owned by Dr. Groves, who lives 300 yards south of the station.
Station mark: Tablet set in sandstone post.

[Latitude 38° 13′ 00.27″. Longitude 80° 44′ 40.21″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Nebo	79 10 57.19	259 06 44.83	4.0045927	6.28
Summersville	123 42 16.46	303 37 39.37	4 1164561	8.12
Wild Cat	185 41 37.28	5 42 06.37	4.0606756	7.15
Cottle	208 06 31.96	28 10 08.76	4.2560235	11.20
Beech	313 28 05.53	133 33 15.25	4.2259592	10.45

HUNTER, NICHOLAS COUNTY, W. VA.

On the south end of a timbered ridge 10 miles northeast of Richwood, W. Va., and 1 mile northeast of the old Hunter place. Ridge is heavily timbered and lines of sight were cut to other stations.
Station mark: Tablet in sandstone post.

[Latitude 38° 16′ 48.57″. Longitude 80° 28′ 22.74″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Beech	31 55 56.49	211 51 02.02	4.3411195	13.63
Madden	89 20 04.34	269 15 43.64	4.0098233	6.36
Cottle	120 13 16.06	300 06 46.94	4.2463215	10.96
Cowen	157 26 23.30	337 24 06.44	4.1447457	8.69
Cliff	226 58 52.91	46 59 43.78	3.4359976	1.70

LOCUST, WEBSTER COUNTY, W. VA.

On Locust Knob, 3 miles east of Wainville, W. Va. Road from Wainville to Webster Springs passes 300 yards south of station. Knob is timbered; instrument elevated 50 feet.
Station mark: Tablet in sandstone post.

[Latitude 38° 28′ 44.96″. Longitude 80° 30′ 57.66″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Cowen	9 49 54.10	189 49 32.24	3.9703534	5.81
Madden	16 13 23.51	196 10 38.42	4.3642278	14.37
Cottle	40 57 32.01	220 52 38.30	4.2431778	10.88
Potato	254 25 51.02	74 33 57.32	4.2931894	12.20
Miller	256 08 59.31	76 13 04.97	3.9934915	6.12
Three Point	258 50 56.30	78 57 05.74	4.1661105	9.11
Payne	283 52 44.76	103 56 35.59	3.9669365	5.76
Turkey	301 39 16.71	121 46 50.69	4.3186129	12.94
Red Oak	334 48 17.58	154 51 05.75	4.1885553	9.59

MADDEN, NICHOLAS COUNTY, W. VA.

On the east end of a timbered ridge 2 miles southeast of Woodbine, W. Va., on land owned by A. Madden, who lives 200 yards north of the station. Road from Camden to Richwood is 100 yards east of the station. View is cut off northwest by west to southwest.

Station mark: A tablet in sandstone post.

[Latitude 38° 16′ 44.50″. Longitude 80° 35′ 23.55″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Beech	4 10 25.69	184 09 51.43	4.2682733	11.53
Cottle	150 49 00.44	330 46 52.25	4.0126026	6.40
Locust	196 10 38.42	16 13 23.51	4.3642278	14.37
Cowen	200 28 13.66	20 30 17.84	4.1126903	8.06
Cliff	260 43 25.26	80 48 36.88	4.0928161	7.70
Hunter	269 15 43.64	89 20 04.34	4.0098233	6.36

MILLER, WEBSTER COUNTY, W. VA.

On Miller Knob, which is cleared, 2.5 miles north of Webster Springs.

Station mark: Tablet in sandstone post.

[Latitude 38° 30′ 01.26″. Longitude 80° 24′ 22.94″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Payne	7 08 29.61	187 08 14.89	3.66₊29o6	2.87
Cottle	53 33 06.60	233 24 07.48	4.4179601	16.27
Locust	76 13 04.97	256 08 59.31	3.993₊915	6.12
Potato	252 46 15.97	72 50 16.60	3.9912161	6.09
Turkey	328 30 16.72	148 33 45.40	4.1929846	9.69

MITTEN, WEBSTER COUNTY, W. VA. Not occupied.

On Mitten Ridge, on the divide between Williams and Janley rivers, 3 miles north of Jake Mullen's, at Three Forks of Williams River. Ridge is flat and heavily timbered.

Station mark: Basswood tree 18 inches in diameter; 4 spikes driven in blazes.

No check on this position.

[Latitude 38° 22′ 34.02″. Longitude 80° 22′ 05.08″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Cottle	85 53 24.39	265 43 00.44	4.3886063	15.20
Three Point	185 55 01.69	5 55 39.61	4.1564343	8.91

NEBO, NICHOLAS COUNTY, W. VA.

About 8 miles nearly south of Summersville and 0.5 mile west of Nebo post office, on a low bald knob, which is cultivated and has a double locust tree standing on highest part. It is on land owned by Mr. King, whose house is 150 yards southwest from signal.

Station mark: Sandstone block 8 by 8 by 30 inches with cross and letters "U. S. G. S." cut on top, set 30 inches in ground.

Signal: Double locust standing on highest part of knob.

Reference marks: Double locust N. 70° W., distant 24 feet; dead walnut snag N. 70° E., distant 125 feet. A plank fence is 50 feet south.

NOTE.—See position by Hawkins, 1913, pages 624–625.

[Latitude 38° 11′ 58.55″. Longitude 80° 51′ 28.17″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Summersville	173 59 55.22	353 59 30.72	3.9638684	5.72
Cottle	225 54 42.49	46 02 32.01	4.4085366	15.92
Fury	259 06 44.83	79 10 57.19	4.0045927	6.28
Beech	293 32 38.08	113 41 59.80	4.3831111	15.01

PAYNE, WEBSTER COUNTY, W. VA.

On Paynes Knob, 1.5 miles south of Webster Springs, W. Va. Knob is heavily timbered; instrument elevated 60 feet.

Station mark: Oak tree 18 inches in diameter, four spikes driven in blazes 2 feet above ground.

[Latitude 38° 27′ 32.71″. Longitude 80° 24′ 46.61″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Cowen	56 40 38.75	236 36 07.31	4.1032736	7.88
Cottle	61 49 12.49	241 40 28.32	4.3662056	14.44
Locust	103 56 35.59	283 52 44.76	3.9669365	5.76
Miller	187 08 14.89	7 08 29.61	3.6642906	2.87
Potato	233 00 21.43	53 04 37.67	4.0947161	7.73

POTATO, WEBSTER COUNTY, W. VA.

On the highest part of Potato Knob, of the Paint Mountain range, at the head of Potato Knob Run and about 1 mile northeast of Woodzell post office, on land owned by Mr. Clark Stolnaker and about one-half mile east of his residence. A small pasture field is about 500 feet west of station and the Stauton-Slovens old State road along the top of Paint Mountain passes around the hill about 1,000 feet south. Paint Mountain Methodist Church is about 1 mile southwest.

Signal: Flag and targets in top of a large sugar maple, which overlooks other trees in every direction, affording a good view all around; a quadripod of dead poles was erected in crotch of forks of tree and extends 32 feet up for instrument stand. Observing platform in top of tree is 82 feet above ground; the corners of platform were securely guyed. Tree was very steady. Instrument elevated 86 feet.

Station mark: A sandstone 8 by 10 by 30 inches set 24 inches in ground, in top of which is a bronze West Virginia tablet; three reference marks were left, consisting of small triangles cut on trees.

Azimuths and distances from station mark to reference marks:

	Azimuth. °	′	Distance from station mark. Feet.
No. 1	358	03	49.65
No. 2	89	03	31.42
No. 3	279	23	8.14

A wire nail was driven in center of each triangle. Station mark set directly under center of instrument.

NOTE.—See position by Kendall, 1913, pages 619–620.

[Latitude 38° 31′ 35.22″ Longitude 80° 17′ 56.53″]

To station—	Azimuth. ° ′ ″	Back azimuth. ° ′ ″	Distance. Log. meters.	Miles.
Payne	53 04 37.67	233 00 21.43	4.0947161	7.73
Cottle	58 49 14.47	238 36 14.95	4.5512013	22.11
Miller	72 50 16.60	252 46 15.97	3.9912161	6.09
Locust	74 33 57.32	254 25 51.02	4.2931894	12.20

RED OAK, WEBSTER COUNTY, W. VA. (Not occupied.)

On Red Oak Knob, on divide between Williams and Cranberry rivers, 3 miles west of Jake Mullen's, at Three Forks of Williams River. Knob is heavily timbered.

Station mark: Chestnut tree 24 inches in diameter; four blazes with spikes driven in each.

Reference mark: Chestnut tree 18 inches in diameter bears northwest 18 feet distant; blaze with spike facing station.

Chestnut tree 15 inches in diameter bears southwest 15 feet distant; blaze with spike facing station tree.

[Latitude 38° 21′ 11.86″ Longitude 80° 26′ 27.02″]

To station—	Azimuth. ° ′ ″	Back azimuth. ° ′ ″	Distance. Log. meters.	Miles.
Cottle	92 25 14.80	272 17 33.55	4.2567703	11.22
Cowen	120 18 38.27	300 15 09.46	3.9756573	5.88
Locust	154 51 05.75	334 48 17.58	4.1885553	9.59
Three Point	204 58 41.85	25 02 02.56	4.2678735	11.51

TURKEY, WEBSTER COUNTY, W. VA. (Not occupied.)

No check on this position. On Turkey Knob, on divide between Williams and Gauley Rivers, 6 miles northeast of Jake Mullen's at three forks of Williams River. Knob is flat and heavily timbered.

Station mark: White maple 16 inches in diameter; four spikes driven in blazes 2 feet above ground.

Reference marks, each having blaze with spike facing station: No. 1, red oak 7 inches in diameter; No. 2, birch 7 inches in diameter; Nos. 3 and 4, each, beech 10 inches in diameter.

[Latitude 38° 22′ 49.86″. Longitude 80° 18′ 47.27″.]

To station—	Azimuth. ° ′ ″	Back azimuth. ° ′ ″	Distance. Log. meters.	Miles.
Locust	121 46 50.69	301 39 16.71	4.3186129	12.94
Miller	148 33 45.40	328 30 16.72	4.1929846	9.66

WILD CAT, NICHOLAS COUNTY, W. VA. (Not occupied.)

On Wild Cat Knob, 1 mile east of Persingeer, W. Va. Cleared on north; timbered on south.

Station mark: Oak tree 12 inches in diameter, blazed with four spikes in each blaze.

Reference mark: Cross cut in large sandstone bowlder over which is a pile of stones; azimuth from tree to cross 262°; distance 15.8 feet.

[Latitude 38° 19′ 11.39″. Longitude 80° 43′ 53.25″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Fury	5 42 06.37	185 41 37.28	4.0606756	7.15
Summersville	70 48 14.81	250 42 58.79	4.1046995	7.91
Cottle	238 45 50.25	58 48 58.17	3.9346042	5.35

THREE POINT, WEBSTER COUNTY, W. VA.

Three miles northeast of Webster Springs, W. Va.

Station mark: Tree on east side of road; triangular blaze on tree, in which a large spike is driven.

[Latitude 38° 30′ 16.49″. Longitude 80° 21′ 04.09″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Mitten	5 55 39.61	185 55 01.69	4.1564343	8.91
Red Oak	25 02 02.56	204 58 41.85	4.2678735	11.51
Cottle	58 15 59.61	238 04 57.12	4.4833948	18.91
Locust	78 57 05.74	258 50 56.30	4.1661105	9.11

SUMMERSVILLE, NICHOLAS COUNTY, W. VA.[1]

On a ridge about 1 milc west of Summerville and very nearly in the prolongation of the main street of the town. The station is marked by cross in top of stone post. The reference marks are at the following distances and directions from the station; 2.14 meters north, 2.22 meters east, 2.13 meters south, and 2.10 meters west. A large lone tree, visible for 40 miles, is 4.69 meters from the station in azimuth 174° 40′ and is marked with a spike. Two stumps marked with spikes are respectively 4.27 meters from the station in azimuth 330° 17′ and 6.34 meters in azimuth 141°51′. A station of the United States Coast and Geodetic Survey.

[Latitude 38° 18′ 55.36″. Longitude 80° 52′ 07.75″.]

To station—	Azimuth.	Back azimuth.	Distance.	
	° ′ ″	° ′ ″	*Log. meters.*	*Miles.*
Briery	288 15 06.66	108 34 34.13	4.6847649	.....
Cottle	245 51 54.95	66 00 09.43	4.3266599	13.18
Wild Cat	250 42 58.79	70 48 14.81	4.1046995	7.91
Collins	282 51 52.49	103 01 44.41	4.3774466	14.82
Fury	303 37 39.37	123 42 16.46	4.1164561	8.12
Beech	309 07 23.15	129 17 09.86	4.4741263	18.52
Nebo	353 59 30.72	173 59 55.22	3.9638684	5.72

[1] See p. 626.

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